360iResearch

Nickel-Based Superalloys for Aerospace Market

Global Forecast 2026-2032

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1. Preface

1.1. Objectives of the Study

- Which suppliers have documented commercial participation in the accepted alloy grades and product forms, and what distinguishes their roles as producers, independent intermediaries, or participants in Captive Supply?
- What buyer-specific qualification, documentation, and supply-commitment requirements determine eligible sourcing, and under what documented conditions could a buyer change supplier, alloy grade, product form, or channel?
- How do material procurement requirements differ across Component Application, Demand Stage, and Aerospace End Market, and where is the connection to aerospace use documented rather than inferred from broader business activity?
- Which ownership, licensing, distribution, purchasing, and jurisdiction-specific access conditions affect participation in the accepted aerospace end markets, and what must be established before a commercial commitment?
- How do Stock Supply and Order-Dedicated Supply interact with Producer-Direct Supply, Independent Intermediary Supply, and Captive Supply in allocating inventory responsibility, delivery commitments, and commercial control?
- Which documented offerings, business rights, and service commitments support supplier selection, buyer targeting, or commercial entry, and what qualification burdens, continuity considerations, and alternative supply routes must accompany those choices?

1.2. Market Definition

The Nickel-Based Superalloys for Aerospace study covers the Global commercial supply and procurement of nickel-based superalloy materials in the accepted Product Form categories: Ingots; Billets and Forging Stock; Bars, Rods and Profiles; Plate, Sheet, Strip and Foil; Wire; Tubes and Pipes; and Powder. The accepted Strengthening Class and Alloy Grade categories identify the material scope without implying that every grade is offered in every form or eligible for every aerospace use.

The buyer boundary encompasses Component & Subassembly Manufacturers; Engine & Propulsion-System Manufacturers; Aerospace Vehicle Manufacturers & Integrators; Maintenance, Repair & Overhaul Organizations; and Research & Development Organizations. Material participation is included across the accepted applications, aerospace end markets, and demand stages, including research and qualification, replacement production, and repair-related material use. Stock Supply, Order-Dedicated Supply, and all accepted supply channels remain within the study.

The studied offering is the material, not the full downstream component, engine, vehicle, research activity, or maintenance service in which it participates. Upstream primary metals and other constituent inputs are adjacent activities rather than included offerings solely

because they enter a superalloy supply chain. Application and demand-stage categories describe material use; they do not add the full value of downstream equipment or services to the material boundary.

1.3. Market Segmentation & Coverage

Product Form distinguishes the material format being procured: Ingots; Billets and Forging Stock; Bars, Rods and Profiles; Plate, Sheet, Strip and Foil; Wire; Tubes and Pipes; and Powder. This lens separates commercially distinct offering formats without assuming that a supplier's participation in one establishes participation in the others.

Strengthening Class comprises Solid-Solution-Strengthened Alloys; Precipitation-Strengthened Alloys; and Dispersion-Strengthened Alloys. These accepted categories organize material-family comparisons. Their inclusion does not establish substitution, buyer acceptance, or a particular supplier's capability.

Component Application comprises Air-Breathing Propulsion & Auxiliary Power, with Turbine Blades & Vanes, Turbine Disks & Rotor Hardware, Compressor Components, Combustion & Exhaust Components, and Engine Structures & Auxiliary Systems beneath it; followed by Rocket & Spacecraft Propulsion; Vehicle Structures & Thermal Protection; and Onboard Systems & Equipment. The hierarchy identifies the downstream application of the studied material rather than treating completed components as separate material offerings.

Demand Stage comprises Initial Equipment Production; Replacement & Retrofit Production; Repair, Overhaul & Refurbishment; and Research, Development & Qualification. This lens distinguishes the purchasing purpose and lifecycle context of material demand. It retains research and repair-related material activity without converting the associated services into separate offerings.

Aerospace End Market comprises Civil & Nonmilitary State Aviation; Military Aviation; Space Systems; and Guided Missile Systems. These categories retain the full accepted aerospace scope while keeping questions about buyer eligibility, procurement authority, and jurisdiction-specific access separate from category inclusion.

Buyer Function comprises Component & Subassembly Manufacturers; Engine & Propulsion-System Manufacturers; Aerospace Vehicle Manufacturers & Integrators; Maintenance, Repair & Overhaul Organizations; and Research & Development Organizations. This lens identifies the purchasing organization's role rather than assuming that the ultimate platform operator directly purchases the material.

Fulfillment Model comprises Stock Supply and Order-Dedicated Supply. It distinguishes the supply arrangement associated with a purchase and is independent of the identity or ownership of the supplying organization.

Supply Channel comprises Producer-Direct Supply; Independent Intermediary Supply; and Captive Supply. It distinguishes commercial routes and organizational relationships. Captive participation remains included, but its inclusion does not establish availability to unaffiliated buyers.

Alloy Grade comprises ABD-900AM; ABD-1000AM; AD730; Alloy xx.xx; Alloy xx.xx; Alloy xx.xx; Alloy xx.xx; Alloy 718Plus; Alloy xx.xx; Alloy X-xx.xx; CM247LC; CMSX-xx.xx; Hastelloy X; Haynes xx.xx; Haynes xx.xx; IN-xx.xx; IN-713C; IN-713LC; IN-xx.xx; IN-738LC; IN-xx.xx; IN-xx.xx; MAR-M xx.xx; Nimonic xx.xx; Nimonic 80A; Nimonic xx.xx; PWA xx.xx; PWA xx.xx; Rene xx.xx; Rene xx.xx; Rene xx.xx; Rene xx.xx; Rene 88DT; Rene xx.xx; RR1000; Udimet xx.xx; Udimet xx.xx; Udimet xx.xx; Udimet 720Li; and Waspaloy. Grade identities are retained individually; the taxonomy does not establish equivalence, supplier rights, or qualification for a particular application.

The axes are independent analytical lenses within the Global market. A material offering can be described through several lenses simultaneously, so the categories do not represent automatically additive commercial opportunities.

Table 1. Global Nickel-Based Superalloys for Aerospace Market Segmentation & Coverage

Segmentation	Coverage
Aerospace End Market	• Civil & Nonmilitary State Aviation • Military Aviation • Space Systems • Guided Missile Systems
Alloy Grade	• Alloy xx.xx • Alloy xx.xx • CMSX-xx.xx • Hastelloy X • Waspaloy • Rene 88DT • RR1000 • PWA xx.xx • Haynes xx.xx • Udimet 720Li • CM247LC • Alloy xx.xx • IN-xx.xx • MAR-M xx.xx • Rene xx.xx • IN-xx.xx • Rene xx.xx • PWA xx.xx • IN-713C • Alloy X-xx.xx • Alloy xx.xx • Rene xx.xx • IN-713LC • Nimonic 80A • Alloy 718Plus • Alloy xx.xx • Rene xx.xx • Udimet xx.xx • AD730 • Nimonic xx.xx • Haynes xx.xx • IN-738LC • Nimonic xx.xx • Rene xx.xx • IN-xx.xx • Udimet xx.xx • Udimet xx.xx • IN-xx.xx • ABD-900AM • ABD-1000AM
Buyer Function	• Component & Subassembly Manufacturers • Engine & Propulsion-System Manufacturers • Aerospace Vehicle Manufacturers & Integrators • Maintenance, Repair & Overhaul Organizations • Research & Development Organizations

Table 1 - continued

Segmentation	Coverage

Component Application	• Air-Breathing Propulsion & Auxiliary Power
	  o Turbine Disks & Rotor Hardware
	  o Engine Structures & Auxiliary Systems
	  o Turbine Blades & Vanes
	  o Combustion & Exhaust Components
	  o Compressor Components
	• Rocket & Spacecraft Propulsion
	• Vehicle Structures & Thermal Protection
	• Onboard Systems & Equipment

Demand Stage	• Initial Equipment Production • Replacement & Retrofit Production • Research, Development & Qualification • Repair, Overhaul & Refurbishment
Fulfillment Model	• Order-Dedicated Supply • Stock Supply
Product Form	• Billets and Forging Stock • Plate, Sheet, Strip and Foil • Bars, Rods and Profiles • Ingots • Powder • Wire • Tubes and Pipes
Strengthening Class	• Precipitation-Strengthened Alloys • Solid-Solution-Strengthened Alloys • Dispersion-Strengthened Alloys
Supply Channel	• Producer-Direct Supply • Independent Intermediary Supply • Captive Supply

Sources & Evidence

1. Anticipated acquisition by Acerinox, S.A. of Haynes International, Inc. - Full text decision

· Taxonomy evidence: The decision distinguishes shape, grade, and material specification as separate nickel-alloy descriptors. These broader-market classifications support distinct analytical questions, not a finding that every retained category is a separate competitive market. ([assets.publishing.service.gov.uk](https://assets.publishing.service.gov.uk/media/67370ebb65b6c2f3313e5d39/__Full_text_decision___.pdf))

· Taxonomy evidence: Paragraphs xx.xx-xx.xx report customer purchasing distinctions between flat and long nickel products and shape-specific demand. The investigation did not establish separate competitive markets for every sub-shape; its findings are not global aerospace demand allocations. ([assets.publishing.service.gov.uk](https://assets.publishing.service.gov.uk/media/67370ebb65b6c2f3313e5d39/__Full_text_decision___.pdf))

· Taxonomy evidence: Footnote xx.xx states that the industry has no single plate-versus-sheet delineation, supporting the retained combined flat-product category rather than a universal dimensional split. ([assets.publishing.service.gov.uk](https://assets.publishing.service.gov.uk/media/67370ebb65b6c2f3313e5d39/__Full_text_decision___.pdf))

· Taxonomy evidence: The decision identifies UNS as a widely accepted grade-designation framework. It does not establish equivalence among all proprietary or nationally named grades in this aerospace taxonomy. ([assets.publishing.service.gov.uk](https://assets.publishing.service.gov.uk/media/67370ebb65b6c2f3313e5d39/__Full_text_decision___.pdf))

· Taxonomy evidence: Paragraph xx.xx identifies billets among commercial nickel-product shapes, alongside bars, wires and tubes. ([assets.publishing.service.gov.uk](https://assets.publishing.service.gov.uk/media/67370ebb65b6c2f3313e5d39/__Full_text_decision___.pdf))

· Taxonomy evidence: Paragraphs xx.xx-xx.xx describe nickel-alloy stockholding, delivery availability, producer sales centers, and independent distributors. These are original supply-chain and customer findings, not the report's excluded market-data estimates.

· Taxonomy evidence: Nickel-alloy service centers hold inventory for customer delivery; customers identify stock availability as a purchasing consideration.

· Taxonomy evidence: The investigation distinguishes manufacturer-direct supply from independent distributors and stockists. Its narrower geographic and product scope does not establish worldwide channel shares.

· Taxonomy evidence: Manufacturer-direct supply includes sales through the manufacturer's service centers or sales offices.

· Taxonomy evidence: Independent distributors and stockists are identified as an indirect nickel-alloy supply path.

2. DPC Holdings Limited - Draft Registration Statement, April 14, 2026

· Taxonomy evidence: The publicly accessible April xx.xx 2026 registration-statement record identifies nickel- and cobalt-based superalloy ingots and separately describes ingot supply for aerospace customers. Together with the regulatory form classification, this corroborates ingots as an aerospace material category; mixed-base-metal disclosures do not provide a nickel-only allocation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))

· Taxonomy evidence: The business record distinguishes superalloy ingots from downstream structural castings and airfoils, supporting the analytical separation of supplied alloy material from component sales value. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))

· Taxonomy evidence: The public registration-statement record distinguishes the issuer's internal superalloy supply from external superalloy sales. This corroborates captive material supply without establishing its global share.

· Taxonomy evidence: The issuer describes supplying superalloy material internally to its affiliated aerospace and industrial-gas-turbine casting facilities; only the aerospace-directed material flow is relevant here.

3. Accelerating Manufacturing Readiness level of ABD®-1000AM for AM of high temperature aerospace components (AMRAM1000)

   · Taxonomy evidence: The Innovate UK project explicitly identifies ABD-1000AM and an aerospace-adoption development objective. Its April 2025-October 2026 funded period establishes developmental activity, not completed production adoption or recurring material sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))

   · Taxonomy evidence: The funded project concerns aerospace demonstrator and readiness advancement, providing a development-demand example without disclosing underlying material-purchase quantities. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))

   · Taxonomy evidence: The project identifies a combustor-tile demonstrator, supporting combustion-component placement for this developmental activity rather than establishing production-market demand. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))

4. New aircraft superalloy - CESAME Project

   · Taxonomy evidence: The European Commission's CESAME results record identifies AD730 as a separately named aircraft-engine alloy evaluated alongside U720Li in a project completed in 2015. This establishes historical aerospace-development relevance, not grade equivalence or current sales. ([cordis.europa.eu](https://cordis.europa.eu/article/id/xx.xx-new-aircraft-superalloy))

5. Influence of Long Term Exposure in Air on Microstructure, Surface Stability and Mechanical Properties of UDIMET 720LI

   · Taxonomy evidence: The aerospace-engine authors explicitly pair UDIMET 720LI with the abbreviation U720LI and identify compressor- and turbine-disk applications, resolving the captured nomenclature inference. This 2000 record does not establish current material sales. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

   · Taxonomy evidence: The introduction distinguishes conventional UDIMET xx.xx from its 720LI derivative, supporting separate grade identities rather than automatic consolidation. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

   · Taxonomy evidence: The introduction identifies aerospace compressor disks as an application of the explicitly named 720LI material. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

   · Taxonomy evidence: The same aerospace-demand-side record identifies turbine disks, corroborating this component category without quantifying its complete rotor-hardware boundary. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

6. Evaluation of the IN 939 Alloy for Large Aircraft Engine Structures

   · Taxonomy evidence: The 2004 aerospace-industry paper identifies IN xx.xx and evaluates its prospective use in large aircraft-engine structures, while distinguishing its established industrial-turbine background. It supports historical developmental relevance, not current aerospace commercial adoption. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2004/Superalloys_2004_441_450.pdf))

   · Taxonomy evidence: The paper's stated aircraft-engine structural application supports placement under engine structures rather than treating all turbine-alloy activity as an airfoil application. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2004/Superalloys_2004_441_450.pdf))

7. ASME International Gas Turbine Institute - 2026 Awards Program

   · Taxonomy evidence: The ASME 2026 awards program identifies paper GT2025-xx.xx as addressing ABD900AM qualification for turbine, aerospace, and energy applications. This independently establishes the exact named material's aerospace-qualification context, not production approval or sales. ([event.asme.org](https://event.asme.org/Events/media/library/resources/turbo/Turbo-2026-Awards-Program.pdf))

8. SAE AMS7075 - Nickel Alloy, Corrosion- and Heat-Resistant, Powder for Additive Manufacturing

   · Taxonomy evidence: The public scope of AMS7075, issued January xx.xx 2026, explicitly covers a corrosion- and heat-resistant nickel alloy supplied as prealloyed powder. This adds a current aerospace-material-standard anchor for the powder form without asserting a proprietary-grade equivalence not stated on the page. ([saemobilus.sae.org](https://saemobilus.sae.org/standards/ams7075-nickel-alloy-corrosion-heat-resistant-powder-additive-manufacturing-50ni-20co-17cr-31w-23ti-21al-21mo-18cb-nb-15ta-004c-0005b))

9. Chapter 2: Aerospace Materials Characteristics
   - Taxonomy evidence: The chapter's superalloy material listing explicitly names Inconel xx.xx. It establishes a material-name anchor but not the full designation crosswalk or current aerospace commercial allocation. No experimental conditions are used for classification. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
   - Taxonomy evidence: The same listing explicitly names Inconel 713LC. This supports partial identity recognition for the retained IN-713LC category; exact normalization and current aerospace-destination trade remain unresolved. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
   - Taxonomy evidence: The aerospace-applications section identifies aircraft turbine engines and rocket engines as distinct superalloy-consuming systems; it does not establish a global allocation. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
   - Taxonomy evidence: The chapter describes nickel-superalloy use across compressor, combustion and turbine sections of aircraft engines. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
   - Taxonomy evidence: Nickel-superalloy turbine blades are explicitly identified. This passage does not separately establish every stationary-vane inclusion. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
   - Taxonomy evidence: The chapter identifies superalloy turbine disks as an aerospace application. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
   - Taxonomy evidence: IN-xx.xx compressor disks and blades, and stronger nickel-base alloys for later compressor stages, are described. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
   - Taxonomy evidence: Combustor materials and the downstream exhaust-nozzle region are distinguished from compressor and turbine components. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
   - Taxonomy evidence: Rocket-engine turbopump blades, disks and housings are identified as superalloy applications, including IN-xx.xx. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
   - Taxonomy evidence: Section xx.xx provides illustrative aerospace superalloy identities, not an exhaustive commercial grade census.
   - Taxonomy evidence: Listed aerospace nickel-base grade.
   - Taxonomy evidence: Listed aerospace superalloy grade.
   - Taxonomy evidence: Named material identity; current commercial allocation is not established.
   - Taxonomy evidence: Identified as an aero-engine blade alloy.

10. 2022 Economic Census - Aerospace Product and Parts Manufacturing Questionnaire (MC-33641)
    - Taxonomy evidence: The questionnaire defines rebuilt/remanufactured products by restoration of a used or worn article and separately distinguishes repair services. This supports lifecycle classification by the existing article being restored, not merely the presence of newly manufactured parts. ([bhs.econ.census.gov](https://bhs.econ.census.gov/ombpdfs2022/export/2022_MC-33641_su.pdf))
    - Taxonomy evidence: The questionnaire separately identifies new products, rebuilt/remanufactured products, services and engine prototypes, supporting lifecycle distinctions without resolving material-order destinations. ([bhs.econ.census.gov](https://bhs.econ.census.gov/ombpdfs2022/export/2022_MC-33641_su.pdf))
    - Taxonomy evidence: The definition allows reused, repaired, and new parts within a rebuilt article, supporting the rule that new material consumption does not automatically constitute initial-equipment or standalone replacement production. ([bhs.econ.census.gov](https://bhs.econ.census.gov/ombpdfs2022/export/2022_MC-33641_su.pdf))
    - Taxonomy evidence: Rebuilt/remanufactured products are distinguished from new products and repair services, supporting a restoration-purpose category. ([bhs.econ.census.gov](https://bhs.econ.census.gov/ombpdfs2022/export/2022_MC-33641_su.pdf))
    - Taxonomy evidence: The questionnaire's reporting unit is an establishment, providing an official statistical anchor for establishment-level buyer-role attribution rather than classifying an entire corporate group as one consumer type. It does not identify the recipient of every material order. ([bhs.econ.census.gov](https://bhs.econ.census.gov/ombpdfs2022/export/2022_MC-33641_su.pdf))
    - Taxonomy evidence: New aircraft engines and new engine parts are explicit product classes. Newly manufactured parts are not necessarily destined for initial installation. ([bhs.econ.census.gov](https://bhs.econ.census.gov/ombpdfs2022/export/2022_MC-33641_su.pdf))
    - Taxonomy evidence: Civilian and military aircraft engines and parts are separately identified, supporting the aviation-sector distinction rather than material volumes. ([bhs.econ.census.gov](https://bhs.econ.census.gov/ombpdfs2022/export/2022_MC-33641_su.pdf))
    - Taxonomy evidence: Military aircraft engines and associated parts have explicit reporting categories. ([bhs.econ.census.gov](https://bhs.econ.census.gov/ombpdfs2022/export/2022_MC-33641_su.pdf))
11. Customs Tariff 2026 - Chapter 75: Nickel and Articles Thereof
    - Taxonomy evidence: Chapter xx.xx separately recognizes unwrought nickel alloys, powders, long products, wire, flat products and tubular products. These classifications cover a wider material boundary than aerospace superalloys. ([cbsa-asfc.gc.ca](https://www.cbsa-asfc.gc.ca/trade-commerce/tariff-tarif/2026/xx.xx-xx.xx/ch75-2026-eng.pdf))
    - Taxonomy evidence: Heading xx.xx recognizes unwrought nickel alloys, providing a broader material-form crosswalk rather than direct aerospace-ingot verification. ([cbsa-asfc.gc.ca](https://www.cbsa-asfc.gc.ca/trade-commerce/tariff-tarif/2026/xx.xx-xx.xx/ch75-2026-eng.pdf))
    - Taxonomy evidence: Subheading xx.xx separately identifies nickel-alloy bars, rods and profiles. ([cbsa-asfc.gc.ca](https://www.cbsa-asfc.gc.ca/trade-commerce/tariff-tarif/2026/xx.xx-xx.xx/ch75-2026-eng.pdf))
    - Taxonomy evidence: Heading xx.xx groups plate, sheet, strip and foil, with a distinct nickel-alloy subdivision. ([cbsa-asfc.gc.ca](https://www.cbsa-asfc.gc.ca/trade-commerce/tariff-tarif/2026/xx.xx-xx.xx/ch75-2026-eng.pdf))
    - Taxonomy evidence: Subheading xx.xx distinguishes nickel-alloy wire from bars, rods and profiles. ([cbsa-asfc.gc.ca](https://www.cbsa-asfc.gc.ca/trade-commerce/tariff-tarif/2026/xx.xx-xx.xx/ch75-2026-eng.pdf))
    - Taxonomy evidence: Subheading xx.xx identifies nickel-alloy tubes and pipes separately from fittings. ([cbsa-asfc.gc.ca](https://www.cbsa-asfc.gc.ca/trade-commerce/tariff-tarif/2026/xx.xx-xx.xx/ch75-2026-eng.pdf))
    - Taxonomy evidence: Heading xx.xx separately recognizes nickel powder products. It does not isolate the aerospace-superalloy subset. ([cbsa-asfc.gc.ca](https://www.cbsa-asfc.gc.ca/trade-commerce/tariff-tarif/2026/xx.xx-xx.xx/ch75-2026-eng.pdf))
12. ASTM B637-26 - Precipitation-Hardening and Cold Worked Nickel Alloy Bars, Forgings, and Forging Stock
    - Taxonomy evidence: The public scope distinguishes forging stock from finished forgings within its nickel-alloy material coverage. ([store.astm.org](https://store.astm.org/standards/b637))
    - Taxonomy evidence: The specification expressly covers nickel-alloy rod and bar as supplied material forms. ([store.astm.org](https://store.astm.org/standards/b637))
    - Taxonomy evidence: The public scope recognizes precipitation-hardenable nickel alloys intended for moderate- or high-temperature service. ([store.astm.org](https://store.astm.org/standards/b637))

13. SAE AMS5670H - Nickel Alloy Bars, Forgings, Rings and Stock for Rings, Forgings and Heading

    · Taxonomy evidence: The aerospace-material scope separately includes stock for forging, rings or heading, supporting a material-stock distinction from component-specific forgings. ([saemobilus.sae.org](https://saemobilus.sae.org/standards/ams5670h-nickel-alloy-corrosion-heat-resistant-bars-forgings-and-rings-stock-rings-forgings-heading-72ni-155cr-095cb-nb-25ti-070al-70fe-x750-xx.xx-f-xx.xx-c-solution-heat-treated-precipitation-hardenable))

    · Taxonomy evidence: The specification identifies X750 as precipitation-hardenable despite its stated delivered condition, supporting separation of alloy family from delivery temper. ([saemobilus.sae.org](https://saemobilus.sae.org/standards/ams5670h-nickel-alloy-corrosion-heat-resistant-bars-forgings-and-rings-stock-rings-forgings-heading-72ni-155cr-095cb-nb-25ti-070al-70fe-x750-xx.xx-f-xx.xx-c-solution-heat-treated-precipitation-hardenable))

14. SAE MAM5914 - Nickel Alloy, Corrosion and Heat Resistant, Sheet, Strip, and Foil

    · Taxonomy evidence: The public aerospace-material scope recognizes sheet, strip and foil as supplied forms within a nickel-alloy material family. This supports category recognition, not current sales or a universal dimensional crosswalk. ([saemobilus.sae.org](https://saemobilus.sae.org/standards/mam5914-nickel-alloy-corrosion-heat-resistant-sheet-strip-foil-525ni-19cr-30mo-50cb-090ti-050al-18fe-consumable-electrode-vacuum-induction-melted-precision-cold-rolled-solution-heat-treated))

15. SAE AMS5832E - Nickel Alloy, Corrosion and Heat Resistant, Welding Wire

    · Taxonomy evidence: The inspected historical revision's public scope recognizes corrosion- and heat-resistant nickel-alloy welding wire as a supplied material form. It does not establish current customer qualification or sales. ([saemobilus.sae.org](https://saemobilus.sae.org/standards/ams5832e-nickel-alloy-corrosion-heat-resistant-welding-wire-525ni-19cr-30mo-51cb-090ti-050al-18fe-consumable-electrode-vacuum-induction-melted))

16. SAE AMS5589H - Nickel Alloy, Corrosion- and Heat-Resistant, Seamless Tubing

    · Taxonomy evidence: The March 2026 aerospace-material specification explicitly recognizes Inconel xx.xx seamless tubing, directly connecting a tubular material form to an in-scope nickel-superalloy identity. ([saemobilus.sae.org](https://saemobilus.sae.org/standards/ams5589h-nickel-alloy-corrosion-heat-resistant-seamless-tubing-525ni-19cr-30mo-51cb-nb-090ti-050al-18fe-inconel-xx.xx-consumable-electrode-remelted-vacuum-induction-melted-xx.xx-f-xx.xx-c-solution-heat-treated))

17. SAE AMS7006 - Nickel Alloy, Corrosion- and Heat-Resistant, Powder for Additive Manufacturing

    · Taxonomy evidence: The aerospace-material specification recognizes supplied nickel-alloy powder for additive manufacturing as a material category distinct from finished components. No technical production conditions are used for segmentation. ([saemobilus.sae.org](https://saemobilus.sae.org/standards/ams7006-nickel-alloy-corrosion-heat-resistant-powder-additive-manufacturing-525ni-19cr-30mo-51cb-nb-090ti-050al-18fe))

18. Materials Needs and R&D Strategy for Future Military Aerospace Propulsion Systems - Appendix E

    · Taxonomy evidence: The aerospace-propulsion case study distinguishes solid-solution and precipitation strengthening within its nickel-superalloy discussion. It supports an alloy-family axis separate from delivered product form. ([nationalacademies.org](https://www.nationalacademies.org/read/xx.xx/chapter/xx.xx))

    · Taxonomy evidence: The case study explicitly recognizes solid-solution-strengthened nickel material within the superalloy discussion. ([nationalacademies.org](https://www.nationalacademies.org/read/xx.xx/chapter/xx.xx))

    · Taxonomy evidence: The case study explicitly recognizes precipitation strengthening as a nickel-superalloy classification distinction. ([nationalacademies.org](https://www.nationalacademies.org/read/xx.xx/chapter/xx.xx))

19. Welding and Brazing of Nickel and Nickel-Base Alloys

- Taxonomy evidence: The public abstract distinguishes solid-solution-hardening, precipitation-hardening and dispersion-hardening nickel-base alloy families. Its broader high-nickel nonheat-treatable category is not adopted because the report boundary is structural superalloys. ([ntrs.nasa.gov](https://ntrs.nasa.gov/citations/xx.xx))
- Taxonomy evidence: The abstract separately recognizes the solid-solution-hardening nickel-base alloy family. ([ntrs.nasa.gov](https://ntrs.nasa.gov/citations/xx.xx))
- Taxonomy evidence: The abstract identifies precipitation-hardening nickel-base alloys and explicitly connects them to aerospace applications. ([ntrs.nasa.gov](https://ntrs.nasa.gov/citations/xx.xx))
- Taxonomy evidence: The abstract recognizes dispersion-hardening nickel-base material as a distinct elevated-temperature family. This historical classification does not establish contemporary sales. ([ntrs.nasa.gov](https://ntrs.nasa.gov/citations/xx.xx))

20. Longitudinal Shear Behavior of Several Oxide Dispersion Strengthened Alloys

- Taxonomy evidence: NASA's August 1978 record explicitly distinguishes commercial oxide-dispersion-strengthened alloys from experimental variants in turbine-related materials research. It supports historical commercial recognition, not present aerospace deliveries or recurring supply. ([ntrs.nasa.gov](https://ntrs.nasa.gov/citations/xx.xx))

21. NASA and Superalloys: A Customer, a Participant, and a Referee

- Taxonomy evidence: The 2008 paper records IN718 in Space Shuttle wing backing and thermal-protection supporting structures, establishing a historical non-engine structural application. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
- Taxonomy evidence: Historical examples include IN718 in Shuttle rudder-speed-brake hardware and International Space Station battery pressure vessels, supporting non-propulsion equipment uses. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
- Taxonomy evidence: Documented Shuttle and space-station applications establish space hardware as a distinct superalloy end-use domain, not a current-demand estimate. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
- Taxonomy evidence: NASA describes superalloy research and development involving government, industry and universities, separately from operational vehicle applications. ([ntrs.nasa.gov](https://ntrs.nasa.gov/citations/xx.xx))
- Taxonomy evidence: The paper distinguishes research participants and funded industry/university development roles. Funding responsibility does not identify the recipient of every material purchase. ([ntrs.nasa.gov](https://ntrs.nasa.gov/citations/xx.xx))

22. North American Industry Classification System, United States, 2022

- Taxonomy evidence: The 2022 classification distinguishes aerospace manufacturing, repair and R&D establishments. It supplies a business-role crosswalk, not a ready-made material-buyer partition. ([census.gov](https://www.census.gov/naics/reference_files_tools/2022_NAICS_Manual.pdf))
- Taxonomy evidence: Aircraft parts, auxiliary equipment, propulsion parts and vehicle-parts manufacturing are recognized activities, supporting a component-producing business role. ([census.gov](https://www.census.gov/naics/reference_files_tools/2022_NAICS_Manual.pdf))
- Taxonomy evidence: Aircraft-engine manufacturing and guided-missile/space-vehicle propulsion-unit manufacturing are separately identified activities. ([census.gov](https://www.census.gov/naics/reference_files_tools/2022_NAICS_Manual.pdf))
- Taxonomy evidence: Complete aircraft, guided-missile and space-vehicle manufacturing are distinguished from supplying parts; satellite manufacturing is separately cross-referenced. ([census.gov](https://www.census.gov/naics/reference_files_tools/2022_NAICS_Manual.pdf))
- Taxonomy evidence: Aerospace R&D outside prototype production is separately cross-referenced, demonstrating why research activity and manufacturing output should not be conflated. ([census.gov](https://www.census.gov/naics/reference_files_tools/2022_NAICS_Manual.pdf))
- Taxonomy evidence: Guided-missile manufacturing and associated propulsion/parts activities are recognized aerospace categories; the classification does not establish nickel-superalloy content. ([census.gov](https://www.census.gov/naics/reference_files_tools/2022_NAICS_Manual.pdf))

23. Parts Manufacturer Approval (PMA) - Design Approval

- Taxonomy evidence: The FAA recognizes replacement and modification articles as distinct commercial approval subjects. This supports aftermarket-purpose classification, not an approval requirement for base alloy material. ([faa.gov](https://www.faa.gov/aircraft/air_cert/design_approvals/pma/pma_des))
- Taxonomy evidence: The page distinguishes articles produced for sale from articles produced by owners/operators for their own equipment, supporting separation of producer role from ultimate operator. ([faa.gov](https://www.faa.gov/aircraft/air_cert/design_approvals/pma/pma_des))
- Taxonomy evidence: The FAA explicitly recognizes repair-station fabrication of articles for in-house repair, showing that maintenance organizations can have material-consuming fabrication roles. ([faa.gov](https://www.faa.gov/aircraft/air_cert/design_approvals/pma/pma_des))

24. 76th PMXG Welding Shops are forging strong bonds

- Taxonomy evidence: The September xx.xx 2015 depot account describes aircraft-engine component repair and lists Inconel among handled materials. It does not identify every consumed grade or product form. ([tinker.af.mil](https://www.tinker.af.mil/News/Article-Display/Article/xx.xx/76th-pmxg-welding-shops-are-forging-strong-bonds/))
- Taxonomy evidence: The Air Force propulsion-maintenance organization documents its own component-restoration activity, providing historical demand-side evidence for the MRO business role. ([tinker.af.mil](https://www.tinker.af.mil/News/Article-Display/Article/xx.xx/76th-pmxg-welding-shops-are-forging-strong-bonds/))
- Taxonomy evidence: The account connects Inconel-handling activity with a military aircraft-engine maintenance setting; it is not evidence of current material quantities. ([tinker.af.mil](https://www.tinker.af.mil/News/Article-Display/Article/xx.xx/76th-pmxg-welding-shops-are-forging-strong-bonds/))

25. Development and validation of a powder HIP route for high temperature Astroloy to manufacture Ultrafan® IP Turbine Casings

- Taxonomy evidence: The 2020-2021 project report identifies nickel-superalloy material for aircraft-engine turbine casings, supporting a structural-engine component category. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting))
- Taxonomy evidence: The funded project concerns development and demonstration of aerospace superalloy casing hardware, establishing developmental rather than recurring production activity. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting))
- Taxonomy evidence: The official project record identifies a technological research organization coordinating the aerospace-material development activity; it does not disclose every material-order recipient. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting))

26. Transforming the manufacturing of aero-engine casing components for Rolls-Royce and its supply chain

- Taxonomy evidence: The institutional impact record distinguishes a provider delivering prototype engine casings from the engine-company customer, supporting separate component-supply and propulsion-system roles. ([impact.ref.ac.uk](https://impact.ref.ac.uk/casestudies/CaseStudy.aspx?Id=xx.xx))
- Taxonomy evidence: The engine company is identified as the customer for casing-development work. This establishes a customer role, not direct purchase of every underlying material lot. ([impact.ref.ac.uk](https://impact.ref.ac.uk/casestudies/CaseStudy.aspx?Id=xx.xx))
- Taxonomy evidence: The record identifies superalloy aero-engine casings as commercially consequential components, corroborating their placement within engine structures. ([impact.ref.ac.uk](https://impact.ref.ac.uk/casestudies/CaseStudy.aspx?Id=xx.xx))

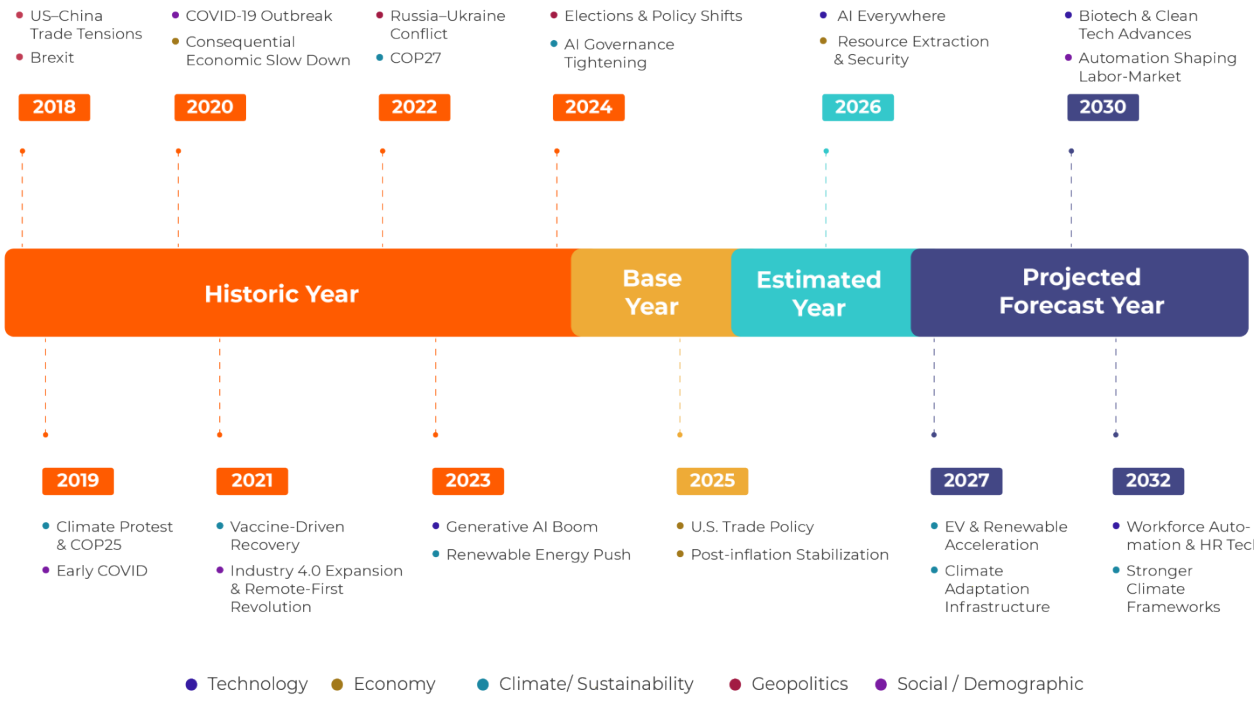
27. NATO Policy for civil/military aircraft operating in support of NATO or NATO-led missions and operations
    - Taxonomy evidence: The ICAO-hosted NATO presentation distinguishes civil aircraft from state aircraft and identifies military, customs and police services within the state-aircraft concept. ([icao.int](https://www.icao.int/sites/default/files/EURNAT/MeetingDocs/ICAO%20EUR%20Region%20Civil-Military%20Cooperation%20Meetings/2015%20ICAO%20Civil-Military%20Cooperation%20Symposium/ICMCS-PPT10.pdf))
    - Taxonomy evidence: Customs and police aircraft demonstrate why a commercial aviation partition needs an explicit treatment for nonmilitary state aviation; their material demand is not quantified. ([icao.int](https://www.icao.int/sites/default/files/EURNAT/MeetingDocs/ICAO%20EUR%20Region%20Civil-Military%20Cooperation%20Meetings/2015%20ICAO%20Civil-Military%20Cooperation%20Symposium/ICMCS-PPT10.pdf))
    - Taxonomy evidence: The presentation treats military-registered aircraft as state aircraft, supporting a distinct military-aviation program classification. ([icao.int](https://www.icao.int/sites/default/files/EURNAT/MeetingDocs/ICAO%20EUR%20Region%20Civil-Military%20Cooperation%20Meetings/2015%20ICAO%20Civil-Military%20Cooperation%20Symposium/ICMCS-PPT10.pdf))
28. Annex 6 - Operation of Aircraft
    - Taxonomy evidence: ICAO's Annex xx.xx account separately recognizes international commercial air transport and general aviation, supporting inclusion of both within the civil-aviation domain without equating civil aviation with airlines alone. ([icao.int](https://www.icao.int/sites/default/files/postalhistory/annex_6_operation_of_aircraft.htm))
29. APICS CPIM 2019 - Part 1 Excerpt
    - Taxonomy evidence: The order-promising discussion distinguishes inventory-backed fulfillment from order-driven supply. The proposed binary taxonomy adapts these commercial concepts rather than reproducing every production-planning category.
    - Taxonomy evidence: The excerpt distinguishes available inventory from inventory already allocated or reserved.
    - Taxonomy evidence: Make-to-order commitments consider material and capacity availability. This supports order-driven supply, but not a universal aerospace rule for reserved buffers.
30. AWI brings its largest ever range of high temperature alloys to Farnborough International Airshow
    - Taxonomy evidence: The company's aerospace business announcement describes made-to-order high-temperature alloy wire alongside held inventory. This corroborates a commercial example, not a market-wide fulfillment allocation.
31. JSC 27301H
    - Taxonomy evidence: Section xx.xx.xx.xx identifies Inconel xx.xx as a superalloy example in spacecraft material requirements.
    - Taxonomy evidence: Section xx.xx.xx.xx identifies Mar-M-xx.xx as a superalloy example. This establishes grade relevance, not inclusion of component sales value.
32. Browse Topic: Vacuum
    - Taxonomy evidence: AMS5966D explicitly names Alloy xx.xx.
    - Taxonomy evidence: AMS5960B explicitly names Alloy xx.xx+, separately from ordinary xx.xx references.
    - Taxonomy evidence: AMS5661H names Alloy xx.xx as a nickel-iron material; its listed identity is consistent with the frozen nickel-predominant inclusion rule.
    - Taxonomy evidence: AMS5598G and AMS5583G name X750 in different material forms, supporting one grade identity across those forms.
    - Taxonomy evidence: AMS5545H explicitly names Rene xx.xx.
33. AIAA-2024-0997
    - Taxonomy evidence: The aerospace propulsion discussion explicitly identifies Haynes xx.xx among established superalloys.

34. Safety First: A Retiring GE Aerospace Materials Engineer Made Protecting Lives His Mission
    - Taxonomy evidence: The engine manufacturer distinguishes Rene xx.xx from Rene 88DT despite shared chemistry, supporting retention as separate recognized grade identities.
    - Taxonomy evidence: The manufacturer identifies Rene 88DT in its GE90 material history.
35. Improved Creep-Fatigue-Oxidation Resistance in Gas Turbine Disc Materials
    - Taxonomy evidence: The institutional impact record identifies RR1000 adoption in Rolls-Royce aero-engines.
    - Taxonomy evidence: The record identifies U720Li and aero-engine adoption. Equating that abbreviation with the displayed Udimet 720Li designation remains an explicit nomenclature inference.
36. Literature Survey on Oxidations and Fatigue Lives at Elevated Temperatures
    - Taxonomy evidence: Identifies IN-xx.xx among nickel-base superalloys; current aerospace trade is not established.
    - Taxonomy evidence: Names 713C; the IN-713C crosswalk and current aerospace trade remain unverified.
    - Taxonomy evidence: Identifies Rene xx.xx among nickel-base superalloys; current aerospace trade is not established.
    - Taxonomy evidence: Identifies Udimet xx.xx among nickel-base superalloys; current aerospace trade is not established.

1.4. Years Considered for the Study

The study designates 2024 as the historical year, 2025 as the base year, 2026 as the estimated year, and 2032 as the forecast year.

Figure 1. Global Nickel-Based Superalloys for Aerospace Market, Years Considered for the Study



1.5. Currency Considered for the Study

The reporting currency is the U.S. dollar (USD). Monetary reporting uses absolute USD values.

1.6. Language Considered for the Study

The report is published in U.S. English.

1.7. Key Stakeholders

- Nickel-based superalloy producers: decisions about grade and product-form participation, buyer qualification commitments, direct supply relationships, and the distinction between externally offered and captive material.
- Independent intermediaries and material distributors: decisions about represented offerings, distribution rights, documentation continuity, inventory responsibility, and Stock Supply versus Order-Dedicated Supply commitments.
- Component & Subassembly Manufacturers: decisions about eligible material sources, required product forms, supplier switching, and the relationship between material procurement and downstream customer requirements.
- Engine & Propulsion-System Manufacturers and Aerospace Vehicle Manufacturers & Integrators: decisions about material-source acceptance, supplier oversight, supply continuity, and alignment of procurement with the relevant aerospace application and program.
- Maintenance, Repair & Overhaul Organizations: decisions distinguishing material procurement for replacement production from material procurement for repair, overhaul, and refurbishment, including the applicability of buyer and program requirements.
- Research & Development Organizations: decisions about sourcing included materials for research, development, and qualification without treating investigational participation as evidence of established production adoption.
- Regulators, public procurement authorities, and standards bodies: interpretation of the jurisdiction-specific legal, purchasing, and qualification conditions relevant to the stated offering and buyer, without equating authorization with adoption.
- Investors and corporate strategy teams: decisions about supplier positioning, partnerships, acquisitions, and commercial entry that distinguish the accepted aerospace-material scope from diversified company activities and downstream equipment businesses.

2. Research Methodology

2.1. Introduction

The Nickel-Based Superalloys for Aerospace study frames commercial decisions around the relationship between a specified material offering and an aerospace purchaser's requirements. It separates the accepted material categories from adjacent upstream inputs and downstream activities, then uses the buyer, application, demand-stage, fulfillment, and channel classifications to define the questions that commercial evidence must answer.

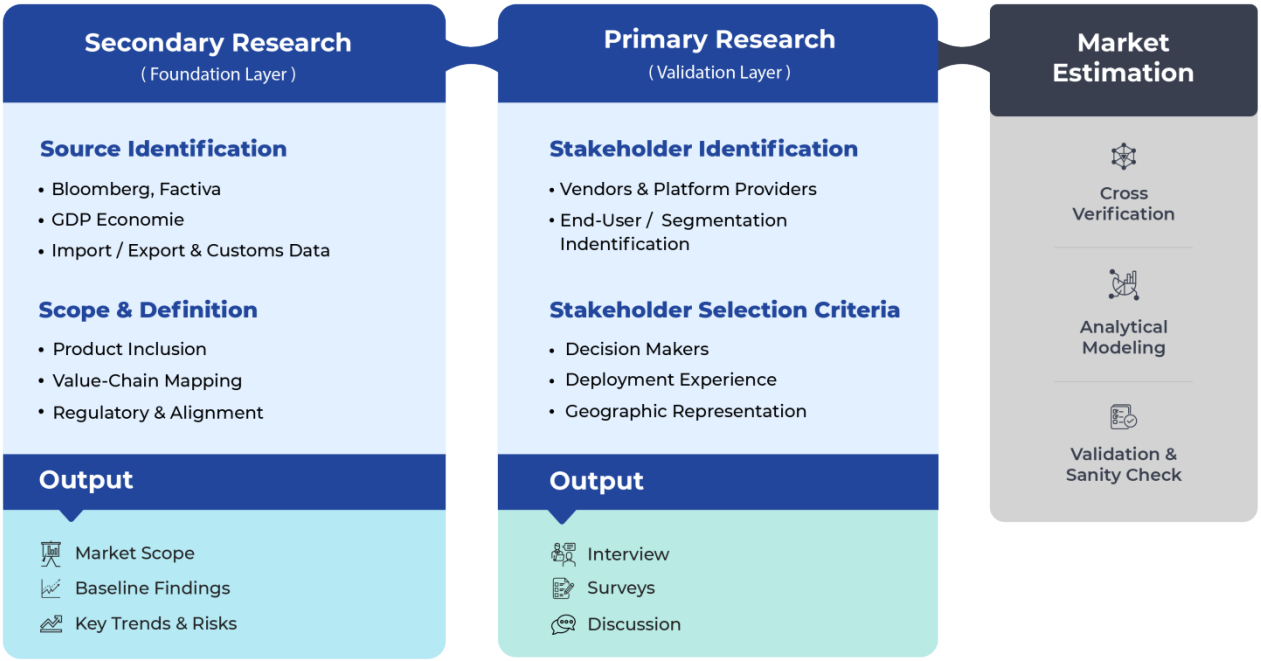
The approach distinguishes observed business facts from economic interpretation. Technical category names provide commercial classification; they do not call for examination of material preparation, experimental procedures, or production methods.

2.2. Research Design

The unit of commercial interpretation is a defined material offering and its business relationship: the relevant alloy grade, product form, aerospace use, buyer function, and supply arrangement. A company-wide claim is not automatically transferable to each offering, application, or jurisdiction in which that company may participate.

Evidence is interpreted according to its authority, effective period, and actual coverage. An advertised offering, an announced development, a permitted business activity, and a buyer-qualified supply relationship establish different facts. The design preserves those distinctions so that competitive or procurement conclusions do not exceed their commercial premises.

Figure 2. Global Nickel-Based Superalloys for Aerospace Market, Research Design



2.2.1. Primary Research

The analyst team conducted primary research as a qualitative challenge layer for market definition, segmentation, demand conditions, adoption barriers, and competitive interpretation. This work tested analytical assumptions and sharpened explanations of market mechanisms without serving as standalone support for numerical estimates.

The qualitative challenge layer is evaluated alongside secondary evidence within the accepted market scope. It informs conditional market explanations and hypotheses for subsequent quantitative analysis. Numerical estimates require their own supporting evidence, and a forecast derived from a qualitative assumption does not independently validate that assumption. Final interpretation must reconcile the qualitative findings with the completed quantitative results.

2.2.2. Secondary Research

Secondary records have distinct evidentiary roles. Official portfolios can establish advertised offerings; mandatory filings can establish disclosed business activities and ownership relationships; licensing and distribution records can establish specified commercial rights; and buyer policies or public awards can establish particular purchasing conditions or dated commitments. Regulatory records establish status only within their stated jurisdiction and scope.

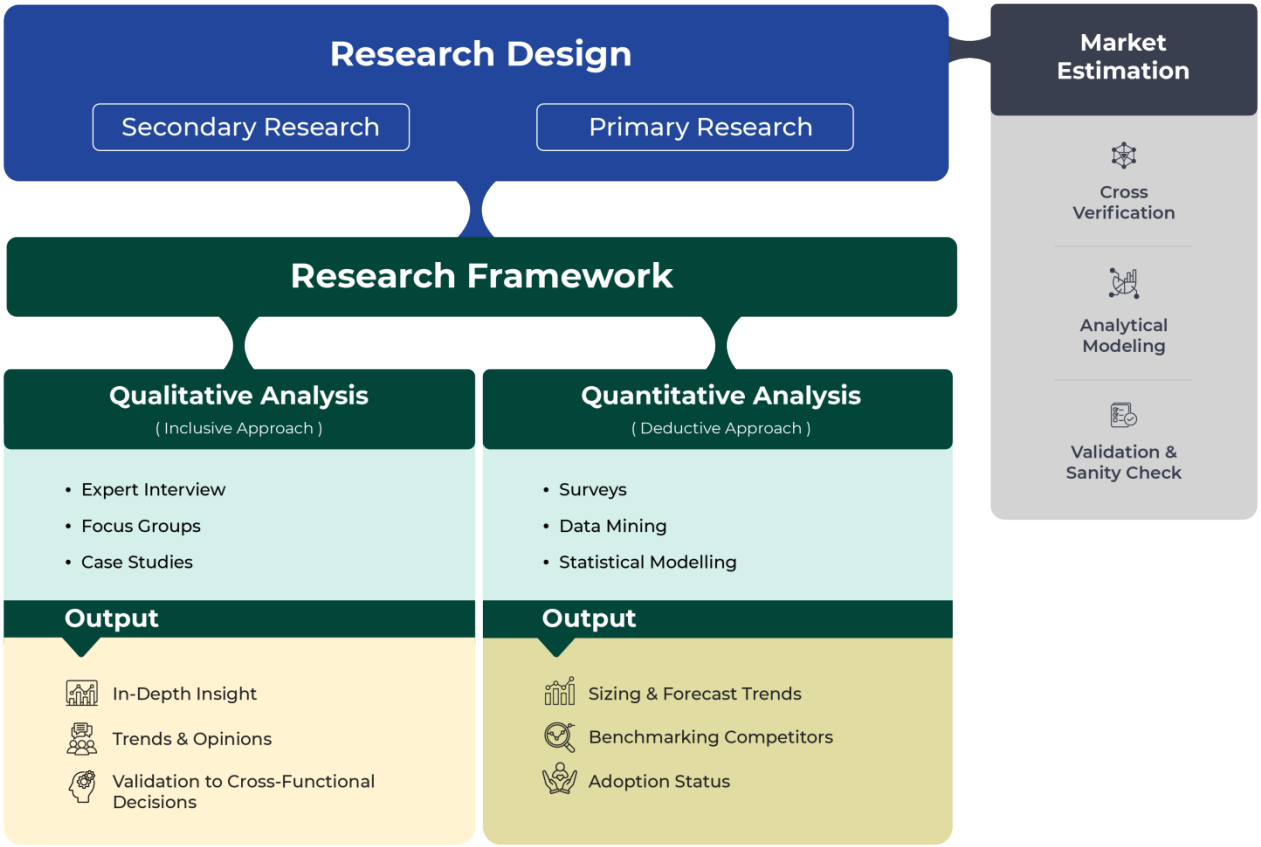
These source roles do not make the records interchangeable. An authorization does not establish adoption, a public award does not establish access to every buyer, and an announcement does not establish continuing availability. Where a claim depends on several commercial conditions, each condition requires support appropriate to its meaning.

2.3. Research Framework

Product Form, Strengthening Class, and Alloy Grade identify the studied offerings. Component Application, Demand Stage, and Aerospace End Market identify the intended use and procurement context. Buyer Function identifies the purchasing role, while Fulfillment Model and Supply Channel distinguish how supply is arranged and through whom it passes.

These relationships organize the commercial questions without determining their answers. Competitive interpretation must connect an offering to an evidenced buyer requirement and supply relationship before drawing implications for entry, switching, distribution, or investment. The Global boundary remains constant across these analytical views.

Figure 3. Global Nickel-Based Superalloys for Aerospace Market, Research Framework



2.3.1. Qualitative Analysis

Qualitative analysis addresses why a buyer could select, retain, or reject a supplier for a particular alloy grade and product form. Relevant commercial questions concern buyer eligibility, documentation, switching requirements, licensing and distribution rights, delivery commitments, inventory responsibility, and supply continuity. These questions are interpreted within the relevant Component Application, Demand Stage, and Aerospace End Market rather than generalized across all aerospace procurement.

Commercial alternatives are assessed conditionally. Stock Supply and Order-Dedicated Supply, for example, provide distinct settings for examining availability commitments and purchasing responsibility; neither category alone establishes a superior procurement choice.

2.3.2. Quantitative Analysis

Quantitative interpretation requires compatible offering boundaries, aerospace attribution, organizational scope, and study periods. A disclosure about an entire materials business cannot be assigned wholly to this study merely because the business also offers an included alloy grade. Likewise, evidence concerning one product form or aerospace application does not establish the same commercial position across the remaining categories.

The segmentation axes are intersecting views of the same market. Comparisons must therefore distinguish a change in classification from a distinct economic activity and must not

combine overlapping views as separate opportunities. Monetary presentation follows the absolute USD reporting convention.

2.4. Market Size Estimation

The measurement subject is nickel-based superalloy material within the accepted aerospace scope, not the complete business of every participating supplier or the full value of downstream engines, components, vehicles, or maintenance services. Inclusion of material used in research or repair does not convert the associated research or service activity into a separate material offering.

Because the accepted Product Form categories can occur at different points in a material's commercial progression, category coverage does not establish an additive monetary perimeter. Any estimate requires an explicit economic boundary before intermediate transfers and converted material can be interpreted together. Captive Supply remains an included commercial relationship but does not, by itself, establish an external sale.

2.4.1. Top-Down Approach

For a top-down perspective, a broader materials or aerospace business aggregate is relevant only to the extent that its boundary can be connected to the accepted nickel-based superalloy material categories and aerospace uses. General nickel activity and complete aerospace equipment businesses provide context rather than direct substitutes for the studied offering.

A broad aggregate cannot establish how activity is distributed among grades, product forms, buyers, or channels without supporting attribution. The Global boundary must also be preserved: evidence concerning a selected country, customer, or program cannot stand for the entire market merely because it is commercially prominent.

2.4.2. Bottom-Up Approach

For a bottom-up perspective, supplier- and offering-level records are relevant when they connect an identifiable business to an included grade or product form and an aerospace commercial role. Portfolio breadth alone does not establish access to each buyer or application, and a distributor listing does not by itself establish a separate producer capability.

Interpretation must distinguish producers, independent intermediaries, and captive relationships. Multiple organizations referring to the same material or supply chain do not automatically represent independent economic opportunities. Any aggregation requires a consistent boundary that separates genuinely distinct activities from successive representations of the same material.

2.5. Data Triangulation

Corroboration requires records that support the same claim within compatible periods and commercial boundaries. A product listing, a buyer-eligibility record, and a contractual disclosure may establish complementary conditions rather than independently prove the

same conclusion. Repetition of an originating announcement does not create independent confirmation.

Where records concern different entities, applications, rights, or supply relationships, interpretation must retain those differences. Conflicts are resolved by the authority and scope of the records for the particular claim, not by selecting the account most favorable to a proposed commercial conclusion.

Figure 4. Global Nickel-Based Superalloys for Aerospace Market, Data Triangulation

2.6. Research Outcomes

The study is intended to support supplier screening, buyer targeting, sourcing choices, channel evaluation, and assessment of commercial entry requirements for Nickel-Based Superalloys for Aerospace. Decision support depends on connecting an identified material offering to its buyer, application, supply relationship, and applicable access conditions, rather than treating inclusion in an aerospace portfolio as sufficient evidence of an addressable opportunity.

Conclusions should distinguish documented commercial participation from conditional opportunities and identify the qualification, contractual, or jurisdiction-specific facts that would change a business decision. The analytical purpose is to explain choices and constraints without presuming a preferred supplier, alloy grade, or route to market.

2.7. Research Assumptions

- Aerospace attribution is specific to the studied material use. A supplier's broader nickel-alloy or diversified materials activity is not assumed to belong wholly to this

market; commercial comparisons require a defensible connection to the accepted aerospace scope.

- An included alloy grade or product form is a study category, not proof of buyer eligibility, current availability, or interchangeability. Sourcing and switching interpretations remain conditional on the applicable buyer and offering requirements.
- The segmentation axes describe intersecting commercial attributes. Their inclusion does not make them additive opportunities, and successive material transfers must not automatically be treated as distinct underlying demand.
- An organizational relationship is interpreted within its documented commercial scope. Ownership, licensing, distribution, and captive arrangements do not automatically confer equivalent rights or customer access on every affiliated business.
- Forward-looking commercial interpretations are conditional on relevant buyer programs, procurement decisions, supply commitments, and applicable access conditions. A prospective application or announced offering is not assumed to become an established purchasing relationship.

2.8. Research Limitations

- A disclosure combining aerospace and non-aerospace activities, several product forms, or multiple businesses cannot independently resolve the corresponding narrower commercial position. Comparisons must remain within the disclosure's actual scope rather than assigning the whole business to an included category.
- A portfolio entry or public announcement does not establish buyer qualification, contractual availability, or permission to supply in every jurisdiction. Commitments based on those conditions require the relevant commercial or authoritative record.
- A grade identity alone does not establish equivalence across suppliers, product forms, or aerospace applications. Substitution conclusions must remain bounded to documented buyer requirements and cannot be inferred from a shared grade label.
- Production location, intermediary location, purchasing location, and ultimate aerospace use describe different geographic relationships. Geographic interpretations require an explicit attribution basis and must not narrow the Global market to the locations visible in particular examples.
- Captive Supply and externally accessible supply have different commercial relationships. Participation within a corporate group does not establish that the same material offering is available to an independent buyer, limiting conclusions about entry routes and alternative sourcing.

3. Executive Summary

3.1. Introduction

The Global Nickel-Based Superalloys for Aerospace market is organized around customer-accepted material relationships, not interchangeable alloy catalogs. Buyers need the required grade and form from an eligible source, with usable records and the commitment required for that purchase. Boeing's contractual sourcing controls and GE Aerospace's separate bidding and order-administration routes show why acceptance, account access, and an order are distinct commercial gates. Sellers must identify both the purchasing entity and acceptance authority before treating a prospect as executable business.

Authorized engine improvements provide a conditional purchasing trigger across new and in-service engines. Rolls-Royce reported the Trent xx.xx XE phase-one blade improvement's June 2025 certification and installation in both settings. GE Aerospace's repair and serviceable-part reuse activities provide a counterforce to new-replacement purchasing. Suppliers should distinguish initial installation, retrofit, and repair-related requirements rather than assume aerospace activity converts uniformly into new-material orders.

Sources & Evidence

1. Boeing Suppliers - Quality
   · Boeing makes supplier-quality applicability contractual and connects raw-material sourcing controls to contractual engineering and quality requirements. This supports distinguishing customer acceptance from general account access. ([boeingsuppliers.com](https://www.boeingsuppliers.com/become/quality))
2. Rolls-Royce Holdings Plc - 2025 Full Year Results
   · Rolls-Royce's 2025 results report June 2025 certification of the Trent xx.xx XE phase-one blade improvement and fitting to new and in-service engines. The record does not identify individual material awards. ([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
3. GE Aerospace - 2025 Sustainability Report
   · GE Aerospace describes component repair and serviceable-part reuse as alternatives that reduce requirements for new replacement parts. Their material consequences depend on the selected workscope. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
4. Boeing BDS Terms and Conditions Guide - D607 Material Substitution Prohibition
   · Boeing D607 prohibits unauthorized substitutions, recognizes authorized alternatives, and makes permitted deviations purchase-contract-specific. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
5. GE Aerospace Supplier Portal
   · GE Aerospace separates potential-supplier inquiries and bidding from order inquiry, acknowledgment, invoicing, and payment administration. (supplier.geaerospace.com)

3.2. CXO Perspective

For producer CEOs and finance leaders, dedicated supply or investment needs a commitment-backed commercial case. ATI Inc. distinguishes multiyear commercial terms from contracts typically established through accepted purchase orders and discloses delayed or incomplete cost recovery through adjustment mechanisms. Commitments should align

purchasing obligations, payment, termination, and schedule-change responsibilities. Waiting preserves flexibility but can delay account access; longer agreements retain planning value without necessarily protecting the entire exposure.

For procurement leaders, corporate diversification and site resilience are separate objectives. Acerinox's completed acquisition of Haynes International, Inc. connects Haynes and VDM Metals under common control. Separate facilities may still protect against local disruption, but these businesses do not provide independent parent exposure. Adding an unrelated source is useful only when its material acceptance and delivery undertaking satisfy the actual requirement.

For sellers serving covered U.S. defense contracts, origin eligibility must be resolved under the governing specialty-metal clause before award. DFARS xx.xx-xx.xx and xx.xx-xx.xx impose different conditions; the latter includes qualifying-country routes and specified exceptions. Warehouse location alone is not the eligibility test. This is a contract-specific access risk, not a U.S.-only restriction on the Global market.

Sources & Evidence

1. ATI 2025 Annual Report
   · ATI distinguishes multiyear commercial terms from contracts typically established through accepted or acknowledged purchase orders. It also discloses delayed or incomplete recovery through surcharge and index mechanisms, while recognizing supply-planning benefits from longer agreements. ([s27.q4cdn.com](https://s27.q4cdn.com/xx.xx/files/doc_financials/2025/ar/ATI-2025-Annual-Report-web-FINAL.pdf))
2. VDM Metals - Acerinox Completes the Acquisition of Haynes International
   · The November xx.xx 2024 announcement records Acerinox's completed Haynes acquisition and connects Haynes and VDM in its high-performance-alloys business. Distinguishing corporate exposure from site resilience is the bounded commercial implication. ([vdm-metals.com](https://www.vdm-metals.com/en/company/news-and-events/news-archive/single/acerinox-completes-the-acquisition-of-haynes-international))
3. DFARS 252.225-7009 - Restriction on Acquisition of Certain Articles Containing Specialty Metals
   · DFARS xx.xx-xx.xx addresses specialty metals in covered articles, recognizes qualifying-country origins and specified exceptions, and excludes unincorporated specialty-metal mill products from a blanket commercial-off-the-shelf exception. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
4. DFARS 252.225-7008 - Restriction on Acquisition of Specialty Metals
   · DFARS xx.xx-xx.xx requires specialty metal delivered under the covered contract to be melted or produced in the United States or its outlying areas. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-specialty-metals.))

3.3. New Revenue Opportunities

Conditional revenue opportunities include substantiated material assurance for Component & Subassembly Manufacturers, accountable strip, foil, and tube sourcing for form-specific buyers, project-bounded ABD powder purchases, and shared EU stocking where customer requirements and customs status align. These are separate purchasing routes, not additive opportunities. Capture requires accepted upstream access and a demonstrated service gap, or the relevant project authority, seller permissions, and regional fulfillment obligations. An

adequate incumbent or direct producer offer can make an additional intermediary unnecessary. The Opportunity Mapping section provides the detailed assessment.

Sources & Evidence

1. Alloyed - About
   · Alloyed records a 2019 ABD licensing agreement with Aubert & Duval. The public history does not disclose the complete grant, qualifying assumptions about third-party commercial access. ([alloyed.com](https://alloyed.com/about))
2. Boeing BDS Terms and Conditions Guide - D607 Material Substitution Prohibition
   · D607 preserves material pedigree through intermediate ownership and constrains unauthorized changes. These conditions qualify assurance-led and shared-stocking opportunities where the clause applies. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
3. Boeing BDS Terms and Conditions Guide - D604 Raw Material Risk Mitigation
   · Where incorporated into the contract, Boeing D604 permits requests for substantive raw-material assurance documentation, including mill undertakings, contracts, and stock evidence. It does not establish the prevalence of unmet assurance needs. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D604_20180220.pdf))
4. UKRI - Accelerating Manufacturing Readiness Level of ABD-1000AM for High Temperature Aerospace Components
   · UKRI identifies an Alloyed-led ABD-1000AM aerospace development project with an April 2025-October 2026 funded period. The record establishes a project context, not recurring production procurement or each purchase signatory. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
5. European Commission - Importation
   · The European Commission explains that customs clearance permits free circulation within EU customs territory. Shared stocking is a conditional commercial inference requiring separate customer acceptance and fulfillment obligations. ([taxation-customs.ec.europa.eu](https://taxation-customs.ec.europa.eu/customs/customs-procedures-import-and-export/importation_en))
6. Ulbrich - Aerospace Engine Components and High-Temperature Alloys
   · Ulbrich advertises nickel-based alloys in continuous precision strip and foil for aerospace products, supporting a concrete form-specific purchasing route. ([ulbrich.com](https://www.ulbrich.com/applications/aerospace-engine-components-high-temp-alloys/))
7. Fine Tubes - Aerospace
   · Fine Tubes lists aerospace nickel-tube offerings including Alloy xx.xx and Alloy xx.xx. These support a tube-specific inquiry without establishing every customer's acceptance. ([finetubes.co.uk](https://www.finetubes.co.uk/markets/aerospace-tubes))
8. Aubert & Duval - Metal Powders, June 2024
   · Aubert & Duval's June 2024 brochure lists ABD-900AM and ABD-1000AM as nickel-superalloy powders and identifies ABD as an Alloyed trademark, supporting named offerings for a bounded purchasing inquiry. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/2024-xx.xx-Aubert-Duval-Metal-Powders-for-Additive-Manufacturing-Brochure_web.pdf))

3.4. Next-Generation Business Models

Established offerings combine material supply with inventory and release administration without necessarily changing the producer. Rolled Alloys advertises customer-site replenishment and supplier-held release arrangements; Haynes International, Inc. provides a producer-operated regional service alternative. Buyers should compare allocation, ownership, release duties, documentation, and unused-material responsibility rather than choose by

channel label. A fulfillment partner is justified when its agreed contribution improves coverage; otherwise direct contracting avoids another dependency.

Powder offerings allocate documentation and commercialization rights differently. EOS GmbH associates nickel powders with its systems and commits to accompanying inspection certificates. Alloyed Ltd.'s recorded ABD license with Aubert & Duval, alongside the latter's ABD-900AM and ABD-1000AM listings, illustrates a rights-based partner route. These are documented models, not unrestricted distribution or universal customer acceptance. An ordinary buyer needs a covered supply offer; a prospective distributor additionally needs the applicable permissions. Documentation convenience and proprietary access must be weighed against supplier and rights-holder dependence.

Sources & Evidence

1. Rolled Alloys - E-Services Stocking Programs
   · Rolled Alloys describes customer-site replenishment, supplier-held orders awaiting release, and scheduled arrangements requiring contractual terms. Ownership, allocation, and unused-material responsibility remain agreement-specific verification questions. ([rolledalloys.com](https://www.rolledalloys.com/eservices/))
2. Alloyed - About
   · The recorded ABD license establishes a rights-based commercialization relationship, not unrestricted distribution permissions for unrelated parties. ([alloyed.com](https://alloyed.com/about))
3. Haynes International - Sales and Service
   · Haynes describes North American service centers, wholly owned European affiliates, on-demand delivery, and end-use support, establishing a producer-operated regional service alternative rather than an order-specific guarantee. ([haynesintl.com](https://haynesintl.com/en/sales-and-service/))
4. EOS - Nickel Alloys for Industrial 3D Printing
   · EOS associates its listed nickel powders with EOS metal systems and states that they ship with inspection certificates. This supports a documentation-linked material model, not universal customer acceptance or mandatory sole sourcing. ([eos.info](https://www.eos.info/metal-solutions/metal-materials/nickel-alloys))
5. Aubert & Duval - Metal Powders, June 2024
   · The ABD-900AM and ABD-1000AM catalog entries connect the licensed relationship to named commercial offerings without establishing unrestricted third-party rights or customer-specific suitability. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/2024-xx.xx-Aubert-Duval-Metal-Powders-for-Additive-Manufacturing-Brochure_web.pdf))

3.5. Industry Roadmap

In 2026-2027, the priority is converting planning visibility into executable coverage within accepted relationships. GE Aerospace reports more stable short-term supplier forecasts and better longer-term visibility, while its portal distinguishes bidding from order acknowledgment. Buyers and sellers should use acknowledged requirements, release dates, customer acceptance, and agreed schedule-change responsibilities as commitment gates. Forecasts remain planning inputs, not purchase obligations.

For 2028-2029 sourcing, monitor whether announced U.S. projects become usable external supply. Doncasters' August 2026 results describe customer-backed Alabama investment, while SeAH Superalloy Technologies' August 2026 announcement presents Temple cast ingot as moving toward production. Neither announcement establishes coverage for a particular outside buyer. Retain established coverage until documented commercial commencement,

required customer acceptance, and an attributable supply undertaking support reliance. Early discussions can preserve an option without making downstream promises dependent on it.

For 2030-2032, tie long-lived commitments to named program awards and material selections rather than assume existing acceptance carries into future programs. GE's reported introduction of ceramic matrix composites into CFM LEAP commercial service in 2016 establishes an application-specific alternative, not universal displacement of nickel superalloys. Monitor program selections and authorized lifecycle workscopes; a shift toward competing materials, repair, or reuse favors contractual flexibility over unsupported dedicated exposure.

Sources & Evidence

1. Boeing Suppliers - Quality
   - Boeing's contract-defined requirements support retaining customer acceptance as a separate commitment gate in the near-term roadmap. ([boeingsuppliers.com](https://www.boeingsuppliers.com/become/quality))
2. GE Aerospace - Annual Report 2025
   - GE Aerospace reports changing supplier demand signals to provide more stable short-term forecasting and greater long-term visibility. This establishes planning information rather than an individual material order. ([geaerospace.com](https://www.geaerospace.com/investor-relations/annual-report))
3. GE Aerospace - 2025 Sustainability Report
   - Documented repair and reuse provide a commercial counterforce to assuming unchanged replacement purchasing over the long-term horizon. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
4. GE Recognized by the American Ceramics Society for Commercializing Ceramic Matrix Composites in Aircraft Engines
   - GE's July xx.xx 2019 announcement states that ceramic matrix composites entered commercial service with CFM LEAP in 2016. This establishes a program-specific alternative, not universal displacement of nickel-superalloy applications. ([geaerospace.com](https://www.geaerospace.com/news/press-releases/research/ge-recognized-american-ceramics-society-world-first-commercializing-ceramic))
5. GE Aerospace Supplier Portal
   - The separate sourcing and order-administration functions support distinguishing planning or bidding access from an acknowledged purchasing transaction. (supplier.geaerospace.com)
6. Doncasters Group - DPC Holdings Reports Strong Second Quarter 2026 Results
   - Doncasters' August xx.xx 2026 results describe an aerospace-customer partnership underpinning investment in a new Alabama superalloy facility. The announcement does not establish an individual outside buyer's supply undertaking. ([ir.doncasters.com](https://ir.doncasters.com/news-and-events/news/news-details/2026/DPC-Holdings-Reports-Strong-Second-Quarter-2026-Results/default.aspx))
7. SeAH Superalloy Technologies - Introducing Cast Ingot
   - SeAH's August xx.xx 2026 announcement presents a non-captive cast-ingot proposition and describes Temple as moving closer to production, rather than establishing order-specific fulfillment. ([seahsuperalloys.com](https://www.seahsuperalloys.com/news/introducing-cast-ingot-expanding-seahs-superalloy-capabilities))

4. Market Overview

4.1. Introduction

[redacted] It encompasses the specified material forms and strengthening classes across initial production, replacement, repair-related use, and research and qualification. Completed components, propulsion systems, vehicles, and maintenance services remain downstream activities rather than the studied material offering.

[redacted] The relevant commercial market is therefore not simply all material carrying a recognized grade name. Buyers must establish the required form, eligible source, documentation, and applicable purchasing authority before treating an offering as an available alternative.

Figure 5. Global Nickel-Based Superalloys for Aerospace Market Size, 2017-2040 (USD Million, Growth %)

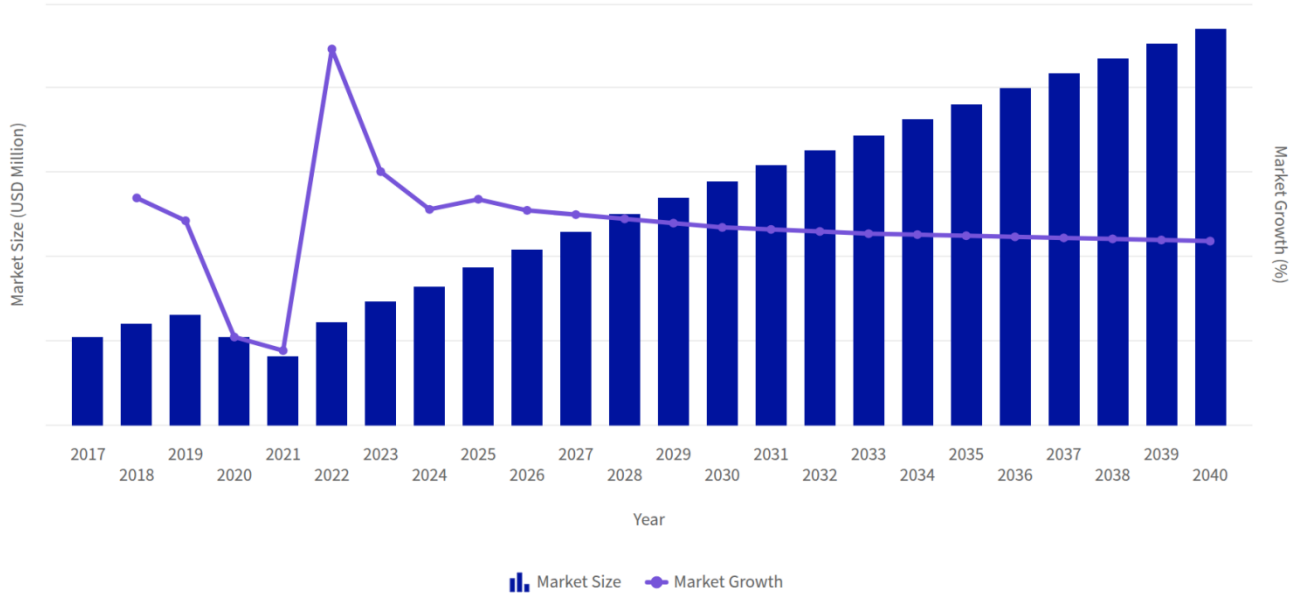


Table 2. Global Nickel-Based Superalloys for Aerospace Market Size, 2017-2040 (USD Million, Growth %)

Metric	2017	2024	2025	2026	2027	2032	2040
Market Size (USD Million)	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Market Growth (%)	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Sources & Evidence

1. Special Metals - Aerospace
   - Special Metals lists INCONEL aerospace offerings corresponding to Alloy xx.xx Alloy xx.xx and Alloy X-xx.xx. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
2. Boeing Suppliers - Quality
   - Boeing connects raw-material sourcing with contractually established engineering and quality requirements. ([boeingsuppliers.com](https://www.boeingsuppliers.com/become/quality))
3. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
4. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
5. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
6. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
7. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
8. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.

4.2. Key Growth Contribution

Authorized engine improvements can create material purchasing requirements across Initial Equipment Production and Replacement & Retrofit Production. Rolls-Royce's June 2025 certification of the Trent xx.xx XE phase-one blade improvement, followed by fitting to new

and in-service engines, illustrates this adoption mechanism. Serving it requires the customer's accepted grade-form-source relationship and an attributable supply commitment, not simply a recognized alloy designation. Longer component life and the availability of repair or serviceable-part reuse can subsequently reduce new-replacement requirements, so an upgrade-related purchasing trigger should not be treated as a permanent material-demand pattern.

Figure 6. Global Nickel-Based Superalloys for Aerospace Market, Key Growth Contribution, by Region, 2025-2032 (USD Million)

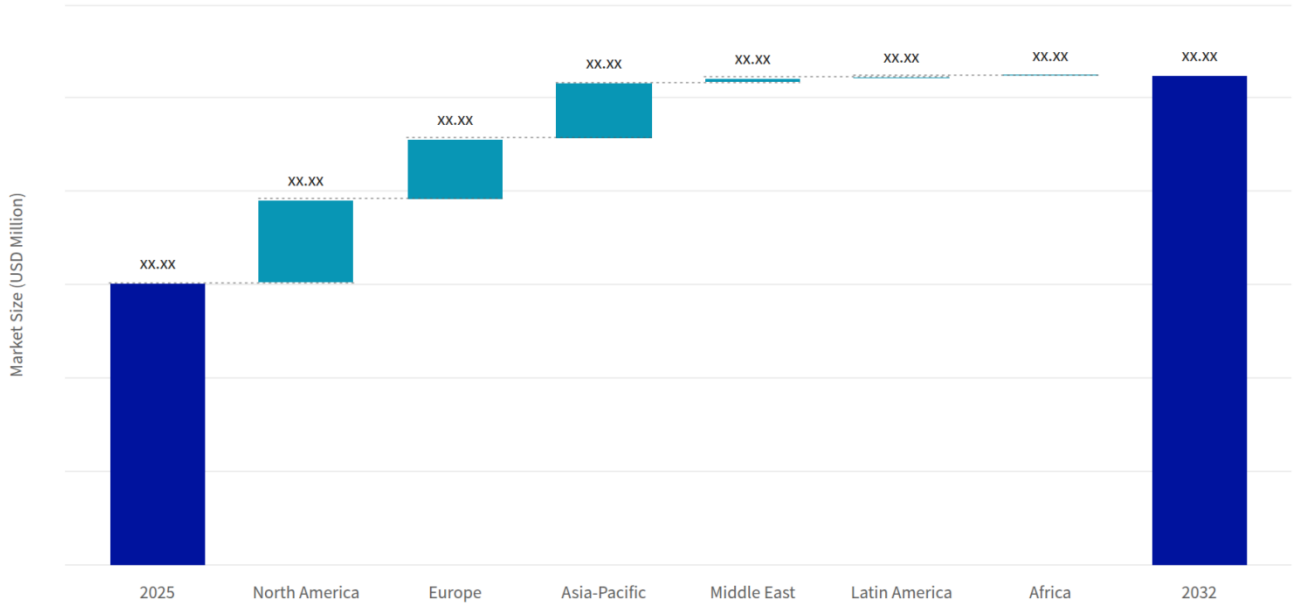


Figure 7. Global Nickel-Based Superalloys for Aerospace Market, Key Growth Contribution, by Country, 2025-2032 (CAGR %)

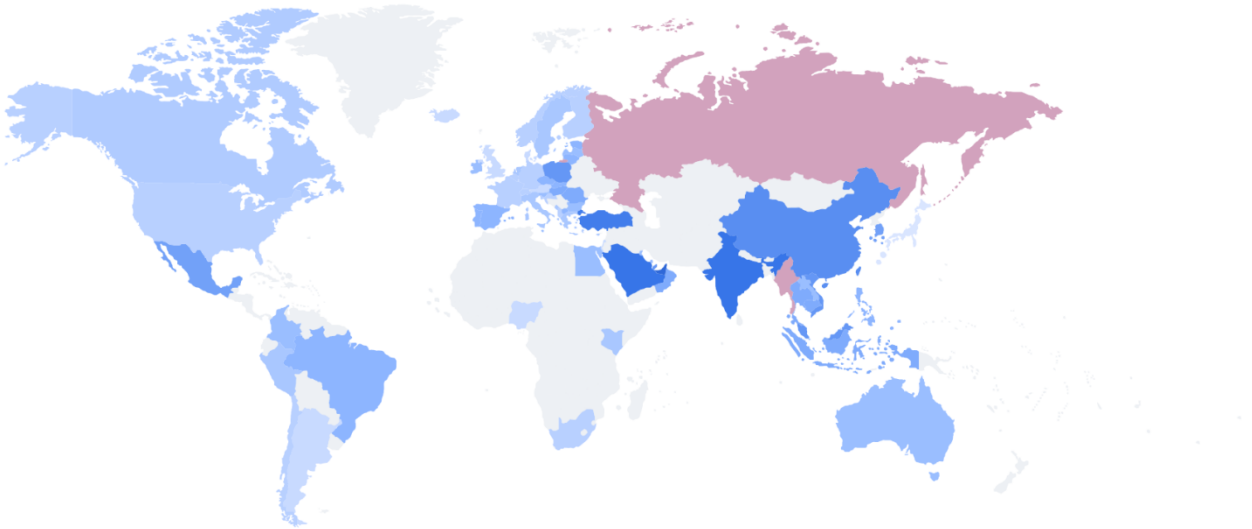


Table 3. Global Nickel-Based Superalloys for Aerospace Market, Key Growth Contribution, 2025-2032

Scope	Leading Category	Added Market Size (USD Million)	Growth Share (%)	CAGR (%)
Aerospace End Market	xx.xx	xx.xx	xx.xx	xx.xx
Alloy Grade	xx.xx	xx.xx	xx.xx	xx.xx
Buyer Function	xx.xx	xx.xx	xx.xx	xx.xx
Component Application	xx.xx	xx.xx	xx.xx	xx.xx
Country	xx.xx	xx.xx	xx.xx	xx.xx
Demand Stage	xx.xx	xx.xx	xx.xx	xx.xx
Fulfillment Model	xx.xx	xx.xx	xx.xx	xx.xx
Product Form	xx.xx	xx.xx	xx.xx	xx.xx
Region	xx.xx	xx.xx	xx.xx	xx.xx
Strengthening Class	xx.xx	xx.xx	xx.xx	xx.xx
Supply Channel	xx.xx	xx.xx	xx.xx	xx.xx

Sources & Evidence

1. Boeing Suppliers - Quality

   • Boeing states that supplier-quality requirements apply as defined by contract, supporting the transaction-specific acceptance condition attached to upgrade-related material purchasing. ([boeingsuppliers.com](https://www.boeingsuppliers.com/become/quality))

2. Rolls-Royce Holdings Plc - 2025 Full Year Results

- Rolls-Royce's 2025 results report June 2025 certification of the Trent xx.xx XE phase-one blade improvement and installation in new and in-service engines. Durability improvement is also a stated objective. ([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders. ([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders. ([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share. ([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share. ([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2028 shop-visit target is below the reported 2025 total despite prospective fleet growth, qualifying any automatic conversion of fleet expansion into proportionate maintenance-material purchasing. ([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment. ([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment. ([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand. ([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand. ([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The divergence between 2025 engine deliveries and shop visits independently challenges a uniform new-engine-led material forecast; no service revenue is included in the numerator. ([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Observed engine-delivery and shop-visit activity supports separate new-program and replacement-demand

3. GE Aerospace - 2025 Sustainability Report
   - GE Aerospace describes repair and serviceable-part reuse as alternatives to newly manufactured replacement parts. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
4. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
5. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
6. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.

7. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

8. ATI Inc. - 2025 Form 10-K
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC's reported financial/product-category inputs and listed ingot offering constrain the eligible material envelope; the ingot allocation remains assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: AA&S sales of USD xx.xx and its xx.xx% nickel-based/specialty-alloy category anchor the separately adjusted rolled-material envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial jet-engine revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025, supporting purchasing recovery but not identifying price growth or a 2032 material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Commercial jet-engine revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025, supporting purchasing recovery but not identifying price growth or a 2032 material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))

9. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
10. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
11. Haynes International - Sales and Service
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Narrow-strip supply supports a limited flat-product allocation within the modeled eligible Carpenter envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire is a disclosed supplied form; its eligible monetary weight remains modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.

13. Haynes International, Inc. - 2023 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical xx.xx% slab/bar/billet revenue category constrains the long-stock proxy; its eligible billet split is assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported combined stock category provides a proxy anchor, not a separately disclosed bar revenue share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 flat products represented approximately xx.xx% of net product revenue; extrapolation to the eligible Acerinox envelope is modeled.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 wire represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 tubulars represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical product revenue, channel mix and backlog conversion anchor the modeled stock value weight, with explicit scope adjustments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Firm backlog and its distinction from short-notice service-center business constrain the complementary dedicated allocation.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 revenue was approximately xx.xx% through the direct organization, including company-operated centers; this is a representative channel calibration, not a Global aerospace share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 revenue was approximately xx.xx% through the direct organization, including company-operated centers; this is a representative channel calibration, not a Global aerospace share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% of fiscal-2023 revenue came through independent distributors, resellers and agents; the model separately assumes the title-taking portion.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% of fiscal-2023 revenue came through independent distributors, resellers and agents; the model separately assumes the title-taking portion.

14. Special Metals - Tech Center
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised ingot supply establishes a PCC material-form crosswalk, not its sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised billet supply supports the forging-stock category mapping within the inherited PCC envelope.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised bar supply supports classification only; the monetary coefficient is an assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Plate, sheet and strip offerings support a distinct flat-product allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire availability supports the material-form crosswalk without establishing revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Tubing availability supports the material-form crosswalk without establishing revenue.
15. DPC Holdings Limited - Registration Statement with 2025 Financial Statements
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing separates ingots from component sales and describes external supply and xx.xx% internal superalloy sourcing, contradicting the inherited xx.xx% captive parameter.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
16. Howmet Aerospace Inc. - 2025 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Casting-alloy activities support an ingot-material equivalent rather than attributing full engine-component revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed metal/billet activities support retaining a forging-stock allocation; the assumed xx.xx% weight is not reported.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported 2025 sales of USD xx.xx and Engine Products aerospace revenues of USD xx.xx commercial and USD xx.xx defense establish the component-cohort scale; USD xx.xx gas-turbine revenue is excluded through an explicit attribution model. These are not material-market revenues. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The segment/end-market revenue table supplies the aerospace and gas-turbine boundaries needed to bridge combined spares activity into an aerospace replacement-material proxy. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial aerospace represented xx.xx% of 2025 company sales, supplying an independent downstream mix comparison rather than a nickel-material allocation weight. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense aerospace represented xx.xx% of 2025 company sales; the paired commercial/defense comparison tests the aviation model while retaining component and material-scope differences. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.

17. Acerinox - Results FY 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned US long-product expansion supports the relative conventional-long-material premise; investment is not recognized as sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately USD xx.xx of planned platform investment includes expansion of the long-products offering, informing the bars forecast premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace demand and planned long-product diversification support testing a relative mix shift without assuming flat-product contraction.
18. Haynes International - HAYNES 282
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Powder is offered alongside conventional forms for HAYNES xx.xx supporting nonexclusive form classification, not an observed sales allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification.
      ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification.
      ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))

19. CMA - Anticipated Acquisition of Haynes International by Acerinox: Full Text Decision
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct customer evidence in paragraphs xx.xx-xx.xx supports separate flat/long purchasing pools; no published market-share table is used.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Shape-specific purchasing supports a distinct long-stock allocation model without proving a separate competitive market for billet.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
20. Haynes International - HAYNES 230
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
21. Carpenter Technology - Advanced Materials for Aerospace Motor & Engines
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))

22. Elementum 3D - Metal Alloy Additive Manufacturing Colorado

    · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed. ([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))

    · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed. ([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))

23. NASA - NASA-Developed Printable Metal Can Take the Heat

    · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake. ([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

    · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake. ([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

24. Carpenter Technology - Lighter, Faster, Stronger Metallurgy for Defense, July 2025

    · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights. ([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

    · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights. ([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

25. Special Metals - Aerospace
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy xx.xx; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy X-xx.xx; no current sales quantity is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Waspaloy; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

26. Boeing - BDS Terms and Conditions Guide, D607 Material Substitution Prohibition, November 15, 2013
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: D607 prohibits unauthorized material substitutions while recognizing specified alternatives. It constrains assumptions about frictionless cross-class substitution, without quantifying adoption delays. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization requirements qualify assumptions about precipitation-family substitution opportunities; the clause does not prove future purchases or a class-growth premium. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause prohibits unauthorized substitutions where contractually applicable. It constrains the adoption interpretation but does not establish approval prevalence or a numerical adoption rate. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific material authorization is a counterweight to treating a named offering as immediately substitutable production material. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization limits interpretation of the assumed adoption multiplier; it does not directly establish powder sales. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))

27. Precision Castparts Corp. - Fiscal 2015 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
28. NASA - Chapter 2: Aerospace Materials Characteristics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
29. ESA - ESA Space Environment Report 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
30. NASA and Superalloys: A Customer, a Participant, and a Referee
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))

31. VDM Metals - Alloys for the Aerospace Industry

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))

32. Howmet Aerospace - 2025 Annual Report, Letter to Shareholders

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% combined aerospace and gas-turbine spares revenue constrains the distinction between initial-production and spare-component activity; material and destination adjustments remain modeled. ([howmet.com](https://www.howmet.com/annualreport/))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed combined spares proportion supplies the replacement proxy; approximately xx.xx% commercial aerospace engine-spares growth is historical counterevidence against assuming weak aftermarket activity. ([howmet.com](https://www.howmet.com/annualreport/))

33. GE Aerospace - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment and services costs provide commercial budget anchors for the common material-value denominator; assumed eligible-material fractions prevent full equipment or service value from entering the allocation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Services include spare parts and maintenance activity, supporting an explicit new-article versus restoration attribution rather than equating services revenue with replacement-material purchases. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported USD xx.xx services cost anchors the restoration-material bridge; the restoration allocation and direct eligible-material fraction are assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Total funded R&D of USD xx.xx supplies a development-budget proxy, not observed nickel-material purchasing; only an assumed eligible-material fraction is used. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.

34. UKRI - Accelerating Manufacturing Readiness level of ABD-1000AM for AM of high temperature aerospace components (AMRAM1000)
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The Alloyed-led project has xx.xx of funding and an April 2025-October 2026 funded period. This independently establishes bounded development activity, not annual material sales or recurring production purchases. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
35. Safran - FY 2025 Results and Investor Update, February 13, 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))

36. Airbus - Full-Year 2025 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 deliveries by aircraft family provide the starting activity comparison for the initial-production forecast; aircraft delivery value is not included in the material numerator. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx% decline in 2025 self-financed R&D is counterevidence to uniform development-budget acceleration and supports a restrained, explicitly assumed development-purchasing scenario. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.

37. Airbus - Half-Year 2026 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 update retained the A320-family, A350 and other production-rate targets, providing a dated commercial constraint on the initial-production activity scenario rather than proof of future material orders. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: First-half 2026 self-financed R&D of EUR xx.xx versus EUR xx.xx provides a modest-growth countercheck for the assumed development-project activity path; the budget is not material-market revenue. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))

38. RTX Corporation - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

39. Federal Reserve Bank of St. Louis - Annual USD/GBP Exchange Rate, AEXUSUK
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
40. L3Harris Technologies, Inc. - Fiscal 2025 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
41. FAA Aerospace Forecast Fiscal Years 2025-2045 - Commercial Space
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated official low/high scenarios provide FY2032 licensed launch/reentry activity bounds. Their U.S.-licensed scope and treatment of reusable vehicles prevent direct conversion into Global material revenue. ([faa.gov](https://www.faa.gov/data_research/aviation/aerospace_forecasts/2025-commercial-space.pdf))
42. ICAO - Convention on International Civil Aviation, Ninth Edition
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))

43. DFARS 252.225-7009 - Restriction on Acquisition of Certain Articles Containing Specialty Metals
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
44. Aubert & Duval - Space Industry Metallurgical Solutions
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
45. Aubert & Duval - Metallurgical Solutions for the Defense Industry, June 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
46. Berkshire Hathaway Inc. - 2025 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.

47. Lufthansa Group Annual Report 2025 - MRO business segment
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
48. Oliver Wyman - Global Fleet And MRO Market Forecast 2026-2036: Key Trends
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
49. German Aerospace Center (DLR) - Financing
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
50. Federal Aviation Administration - Parts Manufacturer Approval (PMA): Design Approval
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.

51. Rolled Alloys - E-Services Stocking Programs
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
52. Boeing BDS Terms and Conditions Guide - D604 Raw Material Risk Mitigation
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
53. Carpenter Technology Corporation - Second Quarter Fiscal 2026 Earnings Call Presentation, January 29, 2026
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation distinguishes specialized non-LTA business from a conventional spot market, countering automatic classification of transactional sales as stock.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Three additional aerospace LTAs and xx.xx% sequential commercial-aerospace bookings growth inform the reservation hypothesis, but do not measure its modeled magnitude.
54. Precision Castparts Corp. - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.

55. Howmet Aerospace - United States Locations
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
56. ATI Inc. - 2024 Annual Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New sales commitments through 2040, including amounts expected during the remainder of the decade and predominantly involving jet-engine nickel alloys, inform the direct-program forecast premise without being counted as realized sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% of fiscal-2024 plate volume went to independent service centers, providing a historical comparison that cautions against assuming generalized intermediary displacement.
57. Alloyed - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.

58. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 aerospace realization and revenue provide the common monetary calibration for this modeled grade; neither is a grade-specific sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace material realization supplies a price-scale input, with modeled year and product-mix adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization calibrates the assumed blended material price, not this grade's observed revenue. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace realization provides a shared monetary comparison for the assumed grade price. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported eight-to-ten-year aerospace application-introduction periods constrain interpretation of the seven-year adoption forecast. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace application-introduction periods provide an adoption-delay counterweight, not a forecast sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
59. European Commission CORDIS - Welding Metallurgy and Cracking in Superalloys: Reporting
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical all-sector tonnage discussion is only a dominance cross-check; it cannot establish current aerospace monetary share. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies 718Plus separately from ordinary xx.xx supporting identity separation without supplying a current sales weight. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
60. Special Metals - Alloy Surcharge Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: August-October 2026 grade surcharges provide a differentiated cost-exposure check, not full invoice prices or observed 2032 prices. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx surcharge sequence independently qualifies a uniform price assumption; it is not substituted for a material selling price. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The grade-specific surcharge listing is a commercial cost comparison, not an observed Global grade realization. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))

61. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current-and-past supplier identity mapping only; not proof of 2025 aerospace sales or the modeled volume. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: CMSX-xx.xx is separately identified; the material-value weight remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current sales are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713C is listed separately from IN-713LC; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713LC is listed separately from IN-713C; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx identity mapping only; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-738LC is separately identified; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current aerospace tonnes are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx appears in a current-and-past identification list; this does not establish recurring aerospace production sales. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: MAR-M xx.xx is identified separately from CM247LC; monetary weights remain modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PWA xx.xx is separately identified; no attributable sales value is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; current commercial scale remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; no current grade-specific material sales are disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Udimet xx.xx appears in the supplier's current-and-past identities; aerospace attribution is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

62. GE Aerospace - Safety First: A Retiring GE Aerospace Materials Engineer Made Protecting Lives His Mission
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
63. Aubert & Duval - AD730: Ni-Based Superalloy for High Temperature Applications
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
64. University of Portsmouth - Improved Creep-Fatigue-Oxidation Resistance in Gas Turbine Disc Materials: REF Impact Case Study
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))

65. Influence of Long Term Exposure in Air on Microstructure, Surface Stability and Mechanical Properties of UDIMET 720LI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The aerospace-industry publication distinguishes conventional Udimet xx.xx from its 720Li derivative; it does not establish a current monetary allocation. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The publication independently supports the 720Li identity and aircraft-engine-disc category, without supplying current sales. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))
66. NASA Contractor Report 174639 - Literature Survey on Oxidations and Fatigue Lives at Elevated Temperatures
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical institutional material identification is a legacy-category anchor only; it does not demonstrate current aerospace material sales. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
67. America Makes - 5566.002 Proliferation of Nickel Superalloy Material Datasets for Powder Bed Fusion Additive Manufacturing
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))
68. GE Aerospace - Fourth Quarter 2025 Earnings Presentation
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 commercial-engine delivery growth supplies a near-term demand cross-check, not a grade-specific purchasing or seven-year growth observation. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aggregate commercial and defense delivery growth constrains the commercial-demand scenario without establishing this grade's attributable consumption. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported defense-engine delivery growth is a demand-exposure check only; the PWA xx.xx activity factor remains assumed. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

4.3. Industry Ecosystem & Value Chain Analysis

Contract structure determines how planning visibility becomes a material obligation. ATI's 2025 annual report distinguishes multiyear agreements defining commercial terms from customer contracts typically established through accepted or acknowledged purchase orders.

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Alloy ownership and material supply can capture value through different relationships. Alloyed records a 2019 licensing agreement with Aubert & Duval covering its ABD platform. ■■■■ ■■■■■■■■■■■■ ■■■ ■ ■■■■■■■■ ■■■■■■■■■■ ■ ■■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■■■ ■■■ ■■■■■■■■■ ■■■■■■■ ■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■ ■■ ■ ■■■■■■■ ■■■■ ■■ ■■■■■■■■■■■ ■■■■■■ ■■ ■■■■■■■■■ ■■■■■ ■■■■■■■ ■■■■■■ ■■ ■■■■■■ ■■ ■■■■■■ ■ ■■■■■ ■■■■■■■■■■

Material relationships can also extend into the return stream. ■■ ■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■ ■■■■■ ■■■■ ■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■■■■ ■■■ ■■■ ■■■■■■■■■■■■ ■■■■■■■■■ Return-material ownership and access can consequently matter to supply relationships, but participation in an aerospace program does not itself grant an independent seller access to those streams.

Sources & Evidence

1. ATI 2025 Annual Report
   · ATI distinguishes multiyear agreements from contracts typically established when purchase orders are accepted or acknowledged. ([s27.q4cdn.com](https://s27.q4cdn.com/xx.xx/files/doc_financials/2025/ar/ATI-2025-Annual-Report-web-FINAL.pdf))
2. Alloyed - About
   · Alloyed's company history records an ABD licensing agreement with Aubert & Duval in 2019. ([alloyed.com](https://alloyed.com/about))
3. GE Aerospace - 2025 Sustainability Report
   · GE describes metal recovery from internal operations, suppliers, and its maintenance network. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))

4.3.1. Supply-Side Analysis

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■■■■■■ ■■■■■■■ ■■■■■■■■■■■■■ ■■■ ■■■■■■■■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■■■ ■■ ■ ■■■■■■ ■■■■■■■■■■■■■■■ ■■■■■■■■■■■■ Such programs can shift inventory administration and delivery timing, but inventory ownership, allocation, and obsolescence exposure still require agreement. A portfolio or stocking-program description should not be treated as a firm delivery commitment for a particular requirement.

■■■■■■■■■ ■■■■■■■ ■■■■ ■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■■ ■■ ■■■■■■ ■■■■■■■■■■■■■ ■■ ■■■■■■■■ ■■■ ■■■■■ ■■■ ■■■ ■■■■■■■ ■■■■■■■■■■ ■■■■■■ ■■■ ■■■ ■■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■■■■■■■■■■ ■■■■■■ ■■■■■■■■■■ Quotations from those businesses consequently do not, by themselves, establish independent parent-level exposure. Common ownership does not prove identical plant risks, interchangeable approvals, or common availability; those remain separate commercial questions.

Sources & Evidence

1. Special Metals - Tech Center
   · Special Metals advertises ingots, billets, plate, sheet, strip, tubing, bar, and wire. ([specialmetals.com](https://www.specialmetals.com/tech-center/))
2. Rolled Alloys - Aerospace
   · Rolled Alloys describes aerospace nickel-alloy inventory and material offerings. ([rolledalloys.com](https://www.rolledalloys.com/markets/aerospace/))
3. Rolled Alloys - E-Services Stocking Programs
   · Rolled Alloys offers replenishment, part-release, and scheduled inventory programs; scheduled arrangements require contract or long-term-agreement terms. ([rolledalloys.com](https://www.rolledalloys.com/eservices/))
4. Haynes International Form 8-K - November 21, 2024
   · Haynes' mandatory filing records the merger closing on November xx.xx 2024, involving Acerinox and North American Stainless. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/tm2428965d6_8k.htm))
5. VDM Metals - Acerinox Completes the Acquisition of Haynes International
   · VDM announced Acerinox's completed Haynes acquisition and described Haynes and VDM forming its high-performance alloys division. ([vdm-metals.com](https://www.vdm-metals.com/en/company/news-and-events/news-archive/single/acerinox-completes-the-acquisition-of-haynes-international))

4.3.2. Demand-Side Analysis

Component & Subassembly Manufacturers, Engine & Propulsion-System Manufacturers, and Aerospace Vehicle Manufacturers & Integrators can occupy different positions in the purchasing relationship. ■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■■■ ■■■ ■■■■ ■■■■■■■■■■■■ ■■■■■■■ ■■ ■■■■■ ■■■ ■■■ ■■■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■ ■■■■■■■■■■ ■■■■ ■■■ ■■ ■■■■■■■■ ■■ ■■■ ■■■■ ■■■■■■■■■■■■■■■■ Procurement must establish both authorities before comparing alternative material offers.

For Maintenance, Repair & Overhaul Organizations, the purchasing trigger is the authorized workscope rather than aircraft utilization alone. ■■■ ■■■■■■■■ ■■■■■■■■■ ■■■ ■■■■■■■■■■■■ ■■■■■■■■ ■■■ ■■■■■■■■■■■■ ■■ ■■■■■ ■■■ ■■■■■■■■■ ■■■■■■■■ ■■■ ■■■■ ■■■■■■■■■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■■■■ ■■■■■■■■■■ ■■ ■■■■■■■■■■■■ ■■■■■■■■ ■■■■■ ■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■■ ■■■ ■■■■■■■■■■■■■■ ■■■■■■■■■ ■■■ ■■■ ■■■■■■■■ ■■ ■■■■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■■■■ Service receipts are not themselves evidence of a corresponding new-material order.

Research & Development Organizations represent a distinct demand stage: material acquired for research or qualification need not become a production award. Across buyer functions, the commercially useful demand record identifies the ordering entity, approving customer, applicable program, and whether the requirement concerns initial equipment, replacement, repair, or qualification. ■■■■■ ■■■■■■■■■■■■ ■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■ ■■■■ ■■■■■ ■■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■■■

Sources & Evidence

1. Boeing Suppliers - Quality
   · Supplier quality requirements and approved-source arrangements illustrate customer control over purchasing acceptance. ([boeingsuppliers.com](https://www.boeingsuppliers.com/become/quality))

2. FAA AC 20-62E - Eligibility, Quality, & Identification of Aeronautical Replacement Parts
   · FAA AC xx.xx-62E concerns quality, eligibility, and traceability of parts and materials intended for U.S. type-certificated products. ([faa.gov](https://www.faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document.information/documentID/xx.xx))
3. Rolls-Royce Holdings Plc - 2025 Full Year Results
   · Rolls-Royce describes flying-hour receipts under long-term service agreements, distinguishing service economics from individual material purchases. ([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

4.3.3. Stakeholder Analysis

Regulators, program customers, material sellers, and purchasing organizations control different permissions. FAA replacement-part guidance concerns the U.S. type-certificated system; Boeing's supplier requirements derive their applicability from the contract. ■ ■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■ ■■■■■■ ■■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■■■ ■■■■■■ ■■■■■■■■■ ■■■■■■■■■■ ■■■■ ■■■■■■ ■■ ■■■■ ■■ ■ ■■■■■■■■■■■ ■■■ ■■■■■■■■■■■■ ■■■ ■■■■■■ ■■■■ ■■■■ ■■■■■■

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Sources & Evidence

1. Boeing Suppliers - Quality
   · Boeing states that applicability of its supplier quality requirements is defined by contract. ([boeingsuppliers.com](https://www.boeingsuppliers.com/become/quality))
2. FAA AC 20-62E - Eligibility, Quality, & Identification of Aeronautical Replacement Parts
   · The circular's stated U.S. type-certificated scope bounds the regulatory stakeholder interpretation. ([faa.gov](https://www.faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document.information/documentID/xx.xx))
3. Rolls-Royce - Our Stakeholders
   · Rolls-Royce describes financial-stability assessments, strategic-supplier continuity plans, and supplier-finance programs. ([rolls-royce.com](https://www.rolls-royce.com/sustainability/customers-and-suppliers))

4.4. Market Dynamics

Demand visibility and immediately fulfillable material demand are different conditions. ■■ ■■■■■■■■■■■ ■■■■ ■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■ ■■■■■ ■■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■■■■ ■■■■ ■■ ■■■■■■ ■■■■■■■■ ■■■■■■■■■ ■■■■■ ■■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■■■ ■■■ ■■■■■■■■ ■■ ■ ■■■■■■■■■■■ ■■■ ■■■■■■■■ ■■■■ ■■■■■ ■■■■■■ ■■■■■ ■■■■■■■■■■ ■■ ■■■■■■■■■■■■ ■■■■■■■■■ Inventory can alter purchasing timing without resolving a downstream component or maintenance constraint.

Lifecycle choices create a further counterforce. ■■■■■■ ■■■ ■■■■■ ■■■ ■■■■■■■ ■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■ ■■ ■■■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■ ■■■■■■ ■■■■■■■■■■ ■■■■■■■■ ■■■ ■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■■ ■■■■■■ ■■■■■■■■■■■■ ■■■■■■ ■■■■■■■■■ ■■■■■■■ ■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■■■■■ ■■■ ■■■■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■ ■■ ■■■■■■■■■■■ ■■■■■■■■■■■■ The decisive commercial indicator is an eligible, documented purchasing requirement for the particular grade and form, supported by a credible fulfillment commitment.

Sources & Evidence

1. Rolled Alloys - E-Services Stocking Programs
   - Its programs accommodate delivery scheduling and customer-held or distributor-held inventory, supporting the timing-buffer interpretation. ([rolledalloys.com](https://www.rolledalloys.com/eservices/))
2. Rolls-Royce Holdings Plc - 2025 Full Year Results
   - Rolls-Royce describes durability improvements intended to change subsequent service requirements. ([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
3. GE Aerospace - Annual Report 2025
   - GE's 2025 account describes interconnected supplier constraints and maintenance turnaround delays, without identifying every affected material obligation. ([geaerospace.com](https://www.geaerospace.com/investor-relations/annual-report))
4. GE Aerospace - 2025 Sustainability Report
   - GE describes repair and reuse as ways to reduce requirements for newly manufactured parts. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))

4.4.1. Key Drivers

4.4.1.1. Program releases translate propulsion requirements into material purchasing

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Sources & Evidence

1. GE Aerospace - Annual Report 2025
   - The annual report describes simultaneous new-engine and aftermarket requirements and supplier-delivery constraints. ([geaerospace.com](https://www.geaerospace.com/investor-relations/annual-report))

4.4.1.2. Authorized fleet upgrades create conditional replacement-material requirements

Rolls-Royce reported certification of a Trent xx.xx XE blade improvement in June 2025 and its introduction into new and in-service engines. ■■■■ ■■■■■■■■■■ ■■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■■■■ ■ ■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■ ■■■■■■■■■■■■ Material demand remains conditional on the approved replacement workscope; longer service life can

subsequently reduce replacement frequency rather than sustain the initial upgrade-related purchasing pattern.

Sources & Evidence

1. Rolls-Royce Holdings Plc - 2025 Full Year Results
   · A Trent xx.xx XE blade improvement was certified in June 2025 and introduced into new and in-service engines; durability is a stated program objective. ([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

4.4.1.3. Named powder partnerships support commercial qualification activity

Aubert & Duval and Alloyed announced ABD-1000AM on June xx.xx 2024, with Aubert & Duval identified as Alloyed's powder production partner, extending their relationship covering ABD-900AM. ■■■■ ■■■■■■■■■■■ ■ ■■■■■ ■■■■■■■■■■ ■■■■■ ■■■■■■■■■■ ■■■■■■ ■■■ ■■■■■■■■■ ■■■■■■■■■■■ ■ ■■■■■■■■■■■■ ■■■■■■■■■ It does not establish customer qualification, unrestricted resale rights, or recurring aerospace production purchases.

Sources & Evidence

1. Aubert & Duval and Alloyed Launch ABD-1000AM Nickel Superalloy at RAPID + TCT
   · The June xx.xx 2024 announcement identifies ABD-1000AM and Aubert & Duval as Alloyed's powder production partner, extending the ABD-900AM relationship. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2024/xx.xx/AD_PR_Launch-of-ABD-1000AM_EN_06-xx.xx-2024.pdf))

4.4.2. Key Restraints

4.4.2.1. Contract-specific authorization limits material switching

Boeing's D607 clause prohibits unauthorized material substitutions and makes authorized deviations specific to the purchase contract. A shared grade designation or attractive alternative offer therefore does not establish permission to switch form or source conditions. ■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■ ■■■■■■■■■ ■■■ ■■■ ■■■■■■ ■■■■ ■■■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■ ■■■■ ■■■■■■ ■■■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■■■

Sources & Evidence

1. Boeing BDS Terms and Conditions Guide - D607 Material Substitution Prohibition
   · Boeing D607 prohibits unauthorized material substitutions, recognizes authorized alternatives, and makes deviations purchase-contract-specific. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))

4.4.2.2. Repair and reuse interrupt the link between maintenance and new material

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associated new-material requirement without excluding Repair, Overhaul & Refurbishment material purchases where those workscopes require them.

Sources & Evidence

1. GE Aerospace - 2025 Sustainability Report
   · GE reports component restoration and used-serviceable-part activities as alternatives to new parts. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))

4.4.2.3. Covered defense contracts restrict eligible material origins

[redacted] A domestic warehouse therefore does not independently establish compliant origin. The restriction concerns covered contracts, not all Global aerospace purchases.

Sources & Evidence

1. DFARS 252.225-7009 - Restriction on Acquisition of Certain Articles Containing Specialty Metals
   · The clause specifies eligible melting or production origins, exceptions, and limitations on the commercial-off-the-shelf treatment of specialty-metal mill products. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))

4.4.3. Key Opportunities

4.4.3.1. Contract-backed assurance for accepted material requirements

Component buyers needing substantiated upstream coverage create an opportunity for accepted material sellers offering contract-backed assurance rather than another catalog entry. [redacted] Capture requires requirement-specific allocation and agreed release and unused-material responsibilities; an advertised program alone does not establish coverage.

Sources & Evidence

1. Rolled Alloys - E-Services Stocking Programs
   · Rolled Alloys advertises replenishment and release arrangements, with contractual terms required for its scheduled program. These descriptions do not reserve material for an individual buyer. ([rolledalloys.com](https://www.rolledalloys.com/eservices/))
2. Boeing BDS Terms and Conditions Guide - D604 Raw Material Risk Mitigation
   · Where incorporated into the contract, Boeing D604 permits the procurement representative to request substantive raw-material assurance documentation, including mill assurances and stock records. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D604_20180220.pdf))

4.4.3.2. Form-specific sourcing and fulfillment accountability

Buyers of precision strip, foil, and tubing can seek accountability tailored to the required form instead of relying on grade breadth. Ulbrich advertises aerospace nickel-alloy strip and foil,

while Fine Tubes lists aerospace nickel tubing. ■■■■■ ■■■■■■■■■ ■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■ ■■■■■■■ ■■ ■■■ ■■■■■■■■■■ ■■■■■■ ■■■■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■■■■ ■ ■■■■■■■■■■ ■■■■ ■■■■■ ■■■■ ■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■ ■■ ■■ ■■■■■■■■■ ■■■■■■ ■■■■■■

Sources & Evidence

1. Ulbrich - Aerospace Engine Components and High-Temperature Alloys
   · Ulbrich advertises nickel-based precision strip and foil for aerospace engine applications. ([ulbrich.com](https://www.ulbrich.com/applications/aerospace-engine-components-high-temp-alloys/))
2. Fine Tubes - Aerospace
   · Fine Tubes lists aerospace nickel-tube offerings including Alloy xx.xx and Alloy xx.xx. A listed designation does not establish every customer's acceptance. ([finetubes.co.uk](https://www.finetubes.co.uk/markets/aerospace-tubes))

4.4.3.3. Project-bounded purchasing of proprietary powder offerings

Named proprietary powders can support defined Research, Development & Qualification purchases without requiring an assumed production award. ■■■■■■ ■ ■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■■ ■■■ ■■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■ ■ ■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■ Sellers need the actual purchasing institution, applicable permissions, and project commitment; recurring production requires a separate customer decision.

Sources & Evidence

1. Alloyed - About
   · Alloyed's corporate history records a 2019 ABD licensing agreement with Aubert & Duval, but does not publish its complete grant. ([alloyed.com](https://alloyed.com/about))
2. UKRI - Accelerating Manufacturing Readiness Level of ABD-1000AM for High Temperature Aerospace Components
   · UKRI identifies an Alloyed-led ABD-1000AM aerospace development project with a funded period from April 2025 through October 2026. It does not establish recurring production procurement. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
3. Aubert & Duval - Metal Powders, June 2024
   · Aubert & Duval's June 2024 powder brochure lists ABD-900AM and ABD-1000AM and identifies ABD as an Alloyed trademark. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/2024-xx.xx-Aubert-Duval-Metal-Powders-for-Additive-Manufacturing-Brochure_web.pdf))

4.4.4. Key Challenges

4.4.4.1. Converting supplier relationships into verifiable supply assurance

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Sources & Evidence

1. Boeing BDS Terms and Conditions Guide - D604 Raw Material Risk Mitigation
   · Boeing D604 permits requests for protection evidence, including contracts, mill assurances, and available-stock documentation. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D604_20180220.pdf))

4.4.4.2. Managing indexation timing and unrecovered contractual exposure

[redacted] Indexation therefore does not eliminate funding or contract-basis exposure. Producers and buyers need aligned reset provisions, purchasing commitments, and schedule-change responsibilities rather than assuming that a surcharge automatically protects the full commercial obligation.

Sources & Evidence

1. ATI 2025 Annual Report
   · ATI describes raw-material exposure that may not be fully recovered through surcharge and index mechanisms. ([s27.q4cdn.com](https://s27.q4cdn.com/xx.xx/files/doc_financials/2025/ar/ATI-2025-Annual-Report-web-FINAL.pdf))
2. ATI Specialty Materials - Tools & Resources
   · ATI Specialty Materials states that customer-specific raw-material indices may differ from its published framework. ([atimaterials.com](https://www.atimaterials.com/specialtymaterials/Pages/tools-resources.aspx))

4.4.4.3. Maintaining usable pedigree across material handoffs

Saint-Gobain Aerospace's March xx.xx 2024 supplier manual links raw-material traceability to finished goods, while FAA receiving guidance emphasizes sufficient traceability and is expressly nonmandatory guidance rather than a regulation. Intermediary and repair-related transactions must preserve the documentation required by the actual buyer. [redacted]

Sources & Evidence

1. Saint-Gobain Aerospace - Supplier Quality Manual, Revision I, March 26, 2024
   · The March xx.xx 2024 manual requires traceability connecting raw materials and finished goods. ([saint-gobain-aerospace.com](https://www.saint-gobain-aerospace.com/sites/hps-mac3-aerospace/files/2024-xx.xx/Supplier%20Quality%20Manual%20Rev.%20I%xx.xx%2003-xx.xx-xx.xx.PDF))
2. FAA AC 20-154A - Guide for Developing a Receiving Inspection System for Aircraft Parts and Materials
   · FAA AC xx.xx-154A emphasizes sufficient receiving traceability and expressly states that it is nonmandatory guidance, not a regulation. ([faa.gov](https://www.faa.gov/airports/resources/advisory_circulars/index.cfm/go/document.information/documentID/xx.xx))

4.5. Porter’s Five Forces Analysis

Rivalry and entry barriers operate within an approved grade, product form, and customer application rather than across an undifferentiated supplier roster. [redacted]

[redacted] Competition among stocking sellers therefore should not be confused with independent competition among qualified material producers.

Buyer and supplier leverage coexist. [redacted] Upstream energy and raw-material dependencies can further constrain a producer that possesses downstream approval.

Substitution is commercially real but application-specific. [redacted] Substitution assessments must therefore distinguish new-program selection from authorized changes to in-service products.

Sources & Evidence

1. Rolled Alloys - Aerospace
   · The distributor's aerospace portfolio establishes a fulfillment role distinct from material production. ([rolledalloys.com](https://www.rolledalloys.com/markets/aerospace/))
2. Boeing BDS Terms and Conditions Guide - D604 Raw Material Risk Mitigation
   · The clause demonstrates a buyer's contractual ability to request substantiated upstream raw-material coverage from its seller. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D604_20180220.pdf))
3. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   · Carpenter describes product- and geography-dependent competition, customer qualification requirements, and upstream raw-material and energy dependencies. ([s21.q4cdn.com](https://s21.q4cdn.com/xx.xx/files/doc_financials/2025/ar/CRS-xx.xx-xx.xx-2025-10K-Print-Only-Final.pdf))
4. GE Recognized by the American Ceramics Society for Commercializing Ceramic Matrix Composites in Aircraft Engines
   · GE's July xx.xx 2019 announcement states that ceramic matrix composites entered commercial service with CFM LEAP in 2016. ([geaerospace.com](https://www.geaerospace.com/news/press-releases/research/ge-recognized-american-ceramics-society-world-first-commercializing-ceramic))

4.6. PESTLE Analysis

Defense sourcing policy and customs treatment impose different access conditions. U.S. specialty-metal requirements concern eligible material origins under covered contracts, not simply the location of a distributor. [redacted]

[redacted]

Intellectual-property protection is another relationship-specific condition. [redacted] The relevant commercial questions are which rights cover the selected offering, where they apply, and whether the proposed seller possesses them.

[redacted] For aerospace-material contracts, metal indexation should not be assumed to absorb electricity, labor, financing, or schedule-change exposure. A supplier's willingness to accept dedicated commitments can consequently depend on the allocation of these obligations, even where the material itself remains approved.

Environmental and social requirements also affect customer administration and access. [redacted] Suppliers must distinguish mandatory contractual disclosures from voluntary credentials; satisfying either does not independently establish a material award.

Sources & Evidence

1. Rolls-Royce - Our Stakeholders
   · Its supplier practices include environmental, ethics, labor, and human-rights screening, improvement plans, and encouragement of environmental-management certification. ([rolls-royce.com](https://www.rolls-royce.com/sustainability/customers-and-suppliers))
2. DFARS 252.225-7009 - Restriction on Acquisition of Certain Articles Containing Specialty Metals
   · Qualifying-country provisions and exceptions qualify a U.S.-only interpretation of covered specialty-metal sourcing. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
3. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   · The filing discloses owned and in-licensed patents, no material dependence on a single such item or related group, and energy cost and availability risks. ([s21.q4cdn.com](https://s21.q4cdn.com/xx.xx/files/doc_financials/2025/ar/CRS-xx.xx-xx.xx-2025-10K-Print-Only-Final.pdf))
4. Canada Border Services Agency - Chapter 75: T2026-2, Nickel and Articles Thereof
   · Canada's 2026 Chapter xx.xx schedule lists nickel-alloy bars, wire, flat products, and tubes under duty-free MFN treatment. ([cbsa-asfc.gc.ca](https://www.cbsa-asfc.gc.ca/trade-commerce/tariff-tarif/2026/html/xx.xx/ch75-eng.html))

4.7. Market Outlook

[redacted] GE Aerospace's account of interconnected supplier constraints supports demand visibility but does not identify every affected grade-form requirement. ATI Inc.'s distinction between multiyear commercial terms and accepted orders identifies a separate turning point: a planning relationship becomes useful supply coverage only to the extent that the actual obligation is established.

[redacted] The relevant indicators are accepted material orders, customer source authorizations, order amendments, and substantiated upstream coverage. Engine activity or a new supplier announcement alone cannot establish an accessible opportunity or justify dedicated exposure.

Sources & Evidence

1. ATI 2025 Annual Report
   - ATI distinguishes multiyear commercial agreements from customer contracts typically established through accepted or acknowledged purchase orders. ([s27.q4cdn.com](https://s27.q4cdn.com/xx.xx/files/doc_financials/2025/ar/ATI-2025-Annual-Report-web-FINAL.pdf))
2. GE Aerospace - Annual Report 2025
   - GE Aerospace's 2025 account describes interconnected supplier constraints, without attributing all engine-level disruption to a particular superalloy requirement. ([geaerospace.com](https://www.geaerospace.com/investor-relations/annual-report))
3. GE Aerospace - 2025 Sustainability Report
   - Repair and reuse qualify an outlook based on maintenance activity because a service event need not require a new replacement component. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))

4.7.1. Near-Term Market Outlook (0-2 Years)

For 2026-2027, the defensible focus is converting visibility into executable coverage within existing accepted material relationships. GE Aerospace reports improving short-term supplier demand signals and longer-term visibility, while its portal separates sourcing activity from order administration. [redacted]

Suppliers should monitor order acknowledgments, release dates, and customer acceptance for the particular grade and form before reserving dedicated material. Buyers should compare coverage from already accepted alternatives where their contracts permit it, rather than rely on a broad shortage narrative. [redacted]

Sources & Evidence

1. Boeing Suppliers - Quality
   · Contract-defined supplier requirements support verifying acceptance separately from the availability of supplier planning information. ([boeingsuppliers.com](https://www.boeingsuppliers.com/become/quality))
2. GE Aerospace - Annual Report 2025
   · GE reports changing supplier demand signals to provide more stable short-term forecasting and longer-term visibility. This establishes planning information, not an individual raw-material order. ([geaerospace.com](https://www.geaerospace.com/investor-relations/annual-report))
3. GE Aerospace Supplier Portal
   · GE's public supplier portal distinguishes potential-supplier inquiries and bids from order acknowledgment, invoicing, and payment administration. (supplier.geaerospace.com)

4.7.2. Medium-Term Market Outlook (3-5 Years)

[redacted] SeAH Superalloy Technologies' August 2026 cast-ingot announcement presents a non-captive Temple proposition while describing the site as moving closer to production. These records establish development pathways, not an obligation to supply a particular outside buyer.

Buyers can preserve these options through commercial discussions, but should make reliance contingent on documented commercial commencement, the required customer acceptance, and an attributable external supply undertaking. [redacted] Announced domestic production also does not independently resolve the origin and acceptance conditions of a covered customer contract.

Sources & Evidence

1. Doncasters Group - DPC Holdings Reports Strong Second Quarter 2026 Results
   · Doncasters' August xx.xx 2026 results describe an aerospace-customer partnership supporting a new Alabama superalloy facility, not completed commercial supply. ([ir.doncasters.com](https://ir.doncasters.com/news-and-events/news/news-details/2026/DPC-Holdings-Reports-Strong-Second-Quarter-2026-Results/default.aspx))
2. SeAH Superalloy Technologies - Introducing Cast Ingot
   · SeAH Superalloy Technologies' August xx.xx 2026 announcement describes Temple as moving closer to production and presents a non-captive cast-ingot proposition. It does not establish order-specific fulfillment. ([seahsuperalloys.com](https://www.seahsuperalloys.com/news/introducing-cast-ingot-expanding-seahs-superalloy-capabilities))
3. Doncasters - New Advanced Manufacturing Facility in Auburn, Alabama, September 2026
   · Doncasters' September 2026 announcement identifies Auburn, Alabama, as a planned new superalloy facility and distinguishes it from the existing Oxford casting operation. ([doncasters.com](https://www.doncasters.com/news/doncasters-announces-a-new-xx.xx-million-advanced-manufacturing-facility-in-auburn-alabama))

4.7.3. Long-Term Market Outlook (5-10 Years)

[redacted] GE's commercialization of ceramic matrix composites with CFM LEAP in 2016 establishes that alternative material families can enter a specific commercial application; it does not establish displacement of every nickel-superalloy use. Producers should connect long-lived commitments to named customer programs rather than assume that an existing qualified grade position guarantees future selection.

Lifecycle purchasing can also change within established programs. Documented repair and reuse provide a counterforce to treating an installed fleet as an unchanged replacement-material requirement. [redacted]

Sources & Evidence

1. GE Aerospace - 2025 Sustainability Report
   - GE's lifecycle activities provide a documented counterforce to assuming that existing replacement-material relationships persist unchanged. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
2. GE Recognized by the American Ceramics Society for Commercializing Ceramic Matrix Composites in Aircraft Engines
   - GE's July xx.xx 2019 announcement states that ceramic matrix composites entered commercial service with CFM LEAP in 2016. This establishes program-specific alternative-material commercialization, not universal superalloy replacement. ([geaerospace.com](https://www.geaerospace.com/news/press-releases/research/ge-recognized-american-ceramics-society-world-first-commercializing-ceramic))

4.8. Go-to-Market Strategy

Material sellers should organize account entry around the purchasing entity and the customer controlling acceptance. [redacted] General supplier credentials should support this inquiry rather than replace it.

An independent intermediary should pursue a release-service proposition only when it can document access to the accepted upstream material and any necessary selling permissions. [redacted]

[redacted]
Intermediary participation adds dependence and divides commercial control; direct producer contracting is preferable when its commitment already meets the buyer's needs.

Negotiate the commercial basis before accepting dedicated exposure. ATI Specialty Materials warns that customer-specific indices can differ from published guidance. [redacted]

For proprietary powders, keep material selling and broader commercialization rights separate. [redacted]
A bounded development-material sale can be appropriate without implying a later production award; broader commitments should wait for the required customer acceptance and contractual grant.

Sources & Evidence

1. Boeing Suppliers - Quality
   - Boeing's supplier-quality page establishes contract-specific requirements, not universal account access from a general supplier credential. ([boeingsuppliers.com](https://www.boeingsuppliers.com/become/quality))
2. Rolled Alloys - E-Services Stocking Programs
   - The advertised programs establish release administration as an actual service proposition, not evidence of an available partnership or customer authorization. ([rolledalloys.com](https://www.rolledalloys.com/eservices/))
3. Alloyed - About
   - The recorded license supports a named commercialization relationship, not unrestricted rights for an unrelated distributor. ([alloyed.com](https://alloyed.com/about))
4. Boeing BDS Terms and Conditions Guide - D607 Material Substitution Prohibition
   - Where applicable, Boeing D607 prohibits unauthorized substitutions and preserves material pedigree through intermediate ownership. Authorized alternatives remain possible. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
5. ATI Specialty Materials - Tools & Resources
   - ATI Specialty Materials warns that customer-specific raw-material indices may differ from published guidance and that calculation methods can change. ([atimaterials.com](https://www.atimaterials.com/specialtymaterials/Pages/tools-resources.aspx))
6. GE Aerospace Supplier Portal
   - The distinct sourcing and transaction-administration routes support separating bid participation from an executable order and identifying the accountable purchasing relationship. (supplier.geaerospace.com)

RESEARCH SAMPLE REPORT

7. Haynes International - Sales and Service

· Haynes advertises North American service centers and wholly owned European affiliates, providing a producer-operated alternative to independent intermediary fulfillment. These are service descriptions rather than order guarantees. ([haynesintl.com](https://haynesintl.com/en/sales-and-service/))

8. Aubert & Duval - Metal Powders, June 2024

· The brochure establishes named proprietary powder offerings, not unrestricted resale rights or customer-specific production acceptance. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/2024-xx.xx-Aubert-Duval-Metal-Powders-for-Additive-Manufacturing-Brochure_web.pdf))

5. Market Insights

5.1. Consumer Insights & End-User Perspective

[redacted] Boeing makes supplier quality applicability contractual, and D607 prohibits unauthorized material substitutions while recognizing authorized alternatives. Before proposing a switch, a seller should establish the ordering entity, source approver, and authorized procurement representative; a shared grade designation does not settle those permissions.

Pre-award participation and executable purchasing are also different stages. GE Aerospace's supplier performance framework covers safety, compliance, quality, and supplier health, while its portal distinguishes inquiries and bidding from order acknowledgment, invoicing, and payment. [redacted]

[redacted] Whether this represents an unmet need depends on the account's existing coverage. A seller should establish that gap before offering additional assurance services; approved alternatives can preserve flexibility, but an apparently accessible offer is less useful when its supporting commitment cannot satisfy the actual obligation.

Sources & Evidence

1. Boeing Suppliers - Quality
   · Boeing states that supplier quality requirements apply as defined by contract and connects raw-material sourcing controls to contractual engineering and quality requirements. ([boeingsuppliers.com](https://www.boeingsuppliers.com/become/quality))
2. Boeing BDS Terms and Conditions Guide - D607 Material Substitution Prohibition
   · Boeing D607 prohibits unauthorized material substitutions, recognizes alternatives specified in the engineering definition, and makes authorized deviations purchase-contract-specific. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
3. Boeing BDS Terms and Conditions Guide - D604 Raw Material Risk Mitigation
   · Where incorporated into the contract, Boeing D604 permits its authorized procurement representative to request substantive raw-material assurance documentation, including mill assurances, contracts, and stock records. The clause establishes an assurance requirement, not the prevalence of unmet buyer needs. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D604_20180220.pdf))

4. GE Aerospace Supplier Portal
   · GE Aerospace separates potential-supplier inquiries and bidding from order inquiry, acknowledgment, invoicing, and payment administration. These functions establish distinct commercial stages rather than equivalent evidence of an accepted purchase. (supplier.geaerospace.com)
5. GE Aerospace - Doing Business with GE Aerospace
   · GE Aerospace describes supplier expectations and performance management addressing safety, compliance, quality, supplier health, transparency, and accountability. ([geaerospace.com](https://www.geaerospace.com/company/doing-business))

5.2. Consumer Experience Benchmarking

For North American nickel-alloy purchases, useful service benchmarks distinguish transaction visibility from supplier support. Rolled Alloys' May 2026 line card advertises shipment tracking and retrieval of certifications, packing slips, and invoices. ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪ ▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪

Published risk allocation can qualify the convenience being offered. Rolled Alloys' U.S. sales terms dated May xx.xx 2026 describe estimated shipping dates, transfer of transit risk at carrier delivery, limited warranty remedies, and exclusion of consequential damages. ▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪ ▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪ ▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪ ▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪▪▪▪▪ ▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪

Sources & Evidence

1. Rolled Alloys - United States Full Line Card, Bulletin 194US, May 2026
   · Rolled Alloys' May 2026 line card advertises order submission, shipment tracking, shipping-location information, and retrieval of certifications and commercial documents. ([rolledalloys.com](https://www.rolledalloys.com/wp-content/uploads/RolledAlloys_Full_LineCard_US.pdf))
2. Haynes International - Sales and Service
   · Haynes advertises North American service-center reach, on-demand delivery, end-use support, and European affiliate relationships. These are service descriptions rather than order-specific guarantees. ([haynesintl.com](https://haynesintl.com/en/sales-and-service/))
3. Rolled Alloys - U.S. Terms and Conditions of Sale, May 6, 2026
   · Rolled Alloys' U.S. sales terms dated May xx.xx 2026 describe estimated shipping dates, transfer of transit risk at carrier delivery, limited warranty remedies, and exclusion of consequential damages. ([rolledalloys.com](https://www.rolledalloys.com/wp-content/uploads/2022/xx.xx/Rolled_Alloys_Sales_Terms_US.pdf))

5.3. Opportunity Mapping

For a seller with access to an accepted upstream source, requirement-specific supply assurance is a lower-change account proposition than an unauthorized material substitute. ▪▪▪▪▪▪▪▪▪ ▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪

[illegible] This prioritization concerns commercial accessibility, not an assertion that fulfillment services are universally more profitable than material production.

Form-specific purchasing provides another bounded route. Ulbrich Stainless Steels & Special Metals, Inc. advertises aerospace nickel-alloy strip and foil alongside upstream sourcing and regional distribution relationships; Fine Tubes provides a separate aerospace tubing proposition within AMETEK Specialty Metal Products. [illegible]

Proprietary Powder has a legitimate project-purchasing opportunity distinct from recurring production supply. Aubert & Duval's brochure lists ABD-900AM and ABD-1000AM, Alloyed Ltd. records an ABD licensing relationship, and UKRI identifies the Alloyed-led ABD-1000AM project with funding through October 2026. [illegible]

[illegible] Direct delivery remains preferable when customer requirements differ materially or a hub adds inventory exposure without a meaningful service benefit. This is a conditional EU fulfillment choice within the Global market, not a conclusion that a regional presence creates uniform access.

Sources & Evidence

1. Alloyed - About
   · The historical licensing relationship supports investigating an existing commercial route before assuming that a material buyer needs a broader commercialization grant. The applicable permissions remain unverified. ([alloyed.com](https://alloyed.com/about))
2. Boeing BDS Terms and Conditions Guide - D607 Material Substitution Prohibition
   · D607 makes permitted deviations contract-specific and prohibits disguising the material's chain of ownership. A new fulfillment relationship therefore does not independently authorize a different material source. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
3. Boeing BDS Terms and Conditions Guide - D604 Raw Material Risk Mitigation
   · D604 establishes a documented buyer need for substantiated upstream coverage rather than a general supplier relationship. The proposed assurance-led proposition is a conditional commercial inference. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D604_20180220.pdf))
4. UKRI - Accelerating Manufacturing Readiness Level of ABD-1000AM for High Temperature Aerospace Components
   · The project record supports a bounded development-purchasing context. A later production relationship requires a separate attributable commercial commitment. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
5. European Commission - Importation
   · The European Commission explains that goods released for free circulation can move within EU customs territory after applicable import requirements are satisfied. Customer material acceptance remains a separate commercial condition. ([taxation-customs.ec.europa.eu](https://taxation-customs.ec.europa.eu/customs/customs-procedures-import-and-export/importation_en))
6. Ulbrich - Aerospace Engine Components and High-Temperature Alloys
   · The aerospace strip-and-foil offering supports a form-specific purchasing inquiry rather than treating every broad alloy catalog as an equivalent alternative. ([ulbrich.com](https://www.ulbrich.com/applications/aerospace-engine-components-high-temp-alloys/))
7. Supply Chain Management That Understands Your Customer | Ulbrich
   · Ulbrich describes upstream sourcing relationships and a German distribution operation handling high-performance nickel alloys. These establish commercial functions, not an individual customer's accepted source or allocation. ([ulbrich.com](https://www.ulbrich.com/company/supply-chain/))
8. Fine Tubes - Aerospace
   · Fine Tubes' named aerospace tubing portfolio establishes a concrete form-specialist comparison for tube buyers, without establishing interchangeability with strip, foil, or other stock forms. ([finetubes.co.uk](https://www.finetubes.co.uk/markets/aerospace-tubes))
9. EOS - Nickel Alloys for Industrial 3D Printing
   · EOS markets system-associated nickel powders and commits to accompanying inspection certificates. This establishes a different documentation relationship, not automatic equivalence to an ABD offering. ([eos.info](https://www.eos.info/metal-solutions/metal-materials/nickel-alloys))
10. Aubert & Duval - Metal Powders, June 2024
    · The named powder portfolio provides a supplier inquiry route. Its application statements are illustrative rather than warranties of suitability, reinforcing the need for transaction-specific acceptance. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/2024-xx.xx-Aubert-Duval-Metal-Powders-for-Additive-Manufacturing-Brochure_web.pdf))

5.4. Distribution Channel Analysis

[illegible] Stock Supply and Order-Dedicated Supply must therefore be assessed separately from channel ownership. For Captive Supply, the relevant purchasing question is internal allocation authority and transfer obligations, not an assumption that affiliated inventory is available to outside buyers.

Rolled Alloys describes arrangements placing replenishment stock at the customer and others retaining material for subsequent release; its scheduled program requires contract or long-term-agreement terms. [illegible] Buyers should retain an order-dedicated alternative when the stocking program cannot cover the accepted material and documentation requirement.

[illegible] This establishes a named commercialization arrangement, not unrestricted intermediary access. An unaffiliated buyer should establish contractual availability and the proposed seller's rights before relying on this route; customer acceptance remains a separate requirement.

Sources & Evidence

1. Rolled Alloys - E-Services Stocking Programs
   · Rolled Alloys describes customer-site replenishment, distributor-held release arrangements, and scheduled programs requiring contract or long-term-agreement terms. ([rolledalloys.com](https://www.rolledalloys.com/eservices/))
2. Aubert & Duval and Alloyed Launch ABD-1000AM Nickel Superalloy at RAPID + TCT
   · The June xx.xx 2024 announcement names Aubert & Duval as Alloyed's ABD-1000AM powder production partner supplying Alloyed and extends the relationship covering ABD-900AM. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2024/xx.xx/AD_PR_Launch-of-ABD-1000AM_EN_06-xx.xx-2024.pdf))
3. Boeing BDS Terms and Conditions Guide - D607 Material Substitution Prohibition
   · D607 requires material pedigree and prohibits disguising intermediate ownership; its substance flows to subcontracts. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
4. Haynes International - Our Company
   · Haynes identifies nickel-alloy product forms and company-operated sales offices and service centers that stock material and provide associated services. ([haynesintl.com](https://haynesintl.com/en/our-company/))

5.5. Pricing Trend Analysis

[illegible]

RESEARCH SAMPLE REPORT

[illegible] Buyers should compare the agreed index basis, reset provisions, commitment date, and downstream recovery terms. An indexed agreement can reduce constituent-material exposure without eliminating a funding mismatch.

[illegible] Fixed commercial terms provide buyer certainty but leave the supplier exposed unless separately addressed; broader adjustment provisions transfer more uncertainty to the buyer. Contract renewal and schedule changes are therefore important points for reviewing residual exposure rather than assuming automatic pass-through.

Trade costs are likewise transaction-specific. Haynes' North American terms permit recovery of duties or tariffs imposed before shipment. [illegible]

Sources & Evidence

1. ATI 2025 Annual Report
   · ATI describes delayed or incomplete raw-material recovery, competitive constraints on pass-through, and separate energy and skilled-labor cost exposures. ([s27.q4cdn.com](https://s27.q4cdn.com/xx.xx/files/doc_financials/2025/ar/ATI-2025-Annual-Report-web-FINAL.pdf))
2. ATI Specialty Materials - Tools & Resources
   · ATI Specialty Materials warns that customer-specific raw-material indices can differ from its published guidance and that calculation methods can change. ([atimaterials.com](https://www.atimaterials.com/specialtymaterials/Pages/tools-resources.aspx))
3. Canada Border Services Agency - Chapter 75: T2026-2, Nickel and Articles Thereof
   · Canada's 2026 Chapter xx.xx schedule lists specified nickel-alloy bars, rods, profiles, wire, flat products, and tubes under duty-free MFN treatment. ([cbsa-asfc.gc.ca](https://www.cbsa-asfc.gc.ca/trade-commerce/tariff-tarif/2026/html/xx.xx/ch75-eng.html))
4. Haynes International - Terms and Conditions of Sale North America
   · Haynes' North American terms permit recovery of duties, taxes, or tariffs imposed before shipment; an inconsistent signed agreement can prevail. ([haynesintl.com](https://haynesintl.com/en/terms-and-conditions-of-sale-north-america/))

5.6. Regulatory Compliance & Standards Framework

Civil-aerospace material access is mediated through the approved production organization's obligations. U.S. xx.xx CFR xx.xx requires production-certificate applicants and holders to maintain supplier controls. [illegible]

[redacted] Boeing defines the applicability of its supplier quality requirements through the contract. Buyers should therefore identify the governing obligation and required documentation without treating either advisory guidance or another customer's approval as universally binding.

Covered U.S. defense procurement requires a further distinction. [redacted] These are covered-contract conditions, not restrictions on every Global aerospace transaction.

Patent exposure and licensing rights are additional, offering-specific questions. Alloyed records an ABD licensing agreement with Aubert & Duval, while Haynes' North American terms state that a goods sale does not grant an implied intellectual-property license. [redacted]

Sources & Evidence

1. Boeing Suppliers - Quality
   · Boeing states that the applicability of its supplier quality requirements is defined by contract. ([boeingsuppliers.com](https://www.boeingsuppliers.com/become/quality))
2. Alloyed - About
   · Alloyed's corporate history records a 2019 ABD licensing agreement with Aubert & Duval. ([alloyed.com](https://alloyed.com/about))
3. DFARS 252.225-7009 - Restriction on Acquisition of Certain Articles Containing Specialty Metals
   · DFARS xx.xx-xx.xx addresses specialty metals incorporated in covered articles and recognizes qualifying-country origins and specified exceptions. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
4. FAA AC 20-154A - Guide for Developing a Receiving Inspection System for Aircraft Parts and Materials
   · FAA AC xx.xx-154A, issued July xx.xx 2024, addresses receiving traceability and explicitly states that it is nonmandatory guidance rather than a regulation. ([faa.gov](https://www.faa.gov/airports/resources/advisory_circulars/index.cfm/go/document.information/documentID/xx.xx))
5. Haynes International - Terms and Conditions of Sale North America
   · Haynes states that selling goods does not expressly or implicitly grant rights or licenses in its intellectual property. ([haynesintl.com](https://haynesintl.com/en/terms-and-conditions-of-sale-north-america/))

6. Electronic Code of Federal Regulations - 14 CFR 21.137, Quality System
   - xx.xx CFR xx.xx requires production-certificate applicants and holders to maintain supplier controls addressing conformity to the production approval holder's requirements and reporting of nonconformity. ([ecfr.gov](https://www.ecfr.gov/current/title-xx.xx/chapter-I/subchapter-C/part-xx.xx/subpart-G/section-xx.xx))
7. EASA - Easy Access Rules for Initial Airworthiness and Environmental Protection, November 2025
   - EU Part xx.xx.A.xx.xx includes vendor control, incoming-material conformity, identification, and traceability requirements. Related EASA acceptable means explain that recognized quality certification does not replace Part xx.xx compliance. ([easa.europa.eu](https://www.easa.europa.eu/en/downloads/xx.xx/en))
8. DFARS 252.225-7008 - Restriction on Acquisition of Specialty Metals
   - DFARS xx.xx-xx.xx requires specialty metal delivered under the covered contract to be melted or produced in the United States or its outlying areas. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-specialty-metals.))

5.7. ESG & Sustainability Analysis

Sustainability requirements can influence supplier administration and access independently of alloy performance. ■■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■■■■ ■■■■■■■ ■■■■■■ ■■■ ■■■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■ ■■■■■■■■■■■ ■■■ ■■■■■■■■■■■ ■■■■■■■■■ ■■ ■■■■■■■ ■■■ ■■■■■■■■■■■ ■■■■■ ■■■■■ ■■■■ ■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■ ■■■■ ■■■■■■■■■■■■■ ■■■■■■ ■■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■■■■ ■■■■ ■■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■■■■■■■■■■■■■■■■■■ ■■■■■■■■■■■■■ ■■ ■■■■■■■■■■■ ■■■ ■■■■■■■■■■■■■ ■■ ■ ■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■■ Participation requires management attention and record sharing, while satisfying an assessment does not itself secure a material award.

Circularity also changes control of material relationships. ■■ ■■■■■■■■■ ■■■■■■■ ■■■■■■■■■■■ ■■■■■■■■■■■■■■■■ ■■■■■■ ■■■■■■ ■■■ ■■■■■■■■■■■ ■■■■■■■■■■ ■■■ ■■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■ ■■■■■■■ ■■■ ■■■■■■■■■■■■■■■■■ ■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■ ■■■ ■■■■■■■■■■■ ■■■■■■■■■■■ ■■ ■■■■■ ■■■■■■■■■■■■■■■ ■■■■■■ ■■■ ■■■■■■ ■■■■ ■■ ■■■ ■■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■ ■■■■■ ■■ ■■■■■■■■■■■■■ ■■■■■■■■■ ■■■■■■ ■ ■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■ ■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■ ■■■■■ ■■■■■■■■■■■■ ■■■ ■■■■■■■■■■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■ ■■■■■■■■■■■■ ■■■ ■■■■■ ■■ ■■■ ■■■■■■■■ ■■■■■■■■■■ ■■■ ■■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■■■■■ ■■ ■■■■■■■■■ ■■■■■■ ■■■ ■■■■■ ■■■ ■■■■ ■■■■■■ ■■■■■■■■■■■■■■■■ ■■■■■■■■■■■■■■ These initiatives should not automatically be interpreted as additional new-material demand or proof of a particular offering's environmental advantage.

Sources & Evidence

1. Rolls-Royce - Our Stakeholders
   - Rolls-Royce describes environmental, ethics, labor, and human-rights supplier screening, further assessments and improvement plans, and encouragement of environmental-management certification. ([rolls-royce.com](https://www.rolls-royce.com/sustainability/customers-and-suppliers))
2. GE Aerospace - 2025 Sustainability Report
   - GE Aerospace reports recovery of high-performance metals across internal operations, suppliers, and its MRO network, alongside repair and serviceable-part reuse. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))

5.8. Disruption & Risk Scenarios

A corporate-level interruption could undermine apparent diversification even when operating facilities differ. ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪ ▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪ ▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ Separate sites may still protect against a local interruption, so common ownership alone does not justify replacing an otherwise dependable source.

An origin-documentation failure could make physically available material unusable for a covered U.S. defense obligation. ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪ ▪▪▪▪ ▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪ ▪▪ ▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪ ▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ Repair-related material purchases remain included, but should be identified separately.

Sources & Evidence

1. VDM Metals - Acerinox Completes the Acquisition of Haynes International
   - The November xx.xx 2024 announcement records Acerinox's completed Haynes acquisition and connects Haynes and VDM within its high-performance-alloys business. It does not establish identical facility risks or allocation policies.
   ([vdm-metals.com](https://www.vdm-metals.com/en/company/news-and-events/news-archive/single/acerinox-completes-the-acquisition-of-haynes-international))
2. GE Aerospace - 2025 Sustainability Report
   - GE describes component restoration and serviceable-part reuse, supporting the conditional scenario in which a changed maintenance workscope leaves dedicated replacement material unused.
   ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
3. DFARS 252.225-7009 - Restriction on Acquisition of Certain Articles Containing Specialty Metals
   - DFARS xx.xx-xx.xx recognizes qualifying-country origins and specified exceptions for covered articles. Unincorporated specialty-metal mill products do not receive a blanket commercial-off-the-shelf exception.
   ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))

4. DFARS 252.225-7008 - Restriction on Acquisition of Specialty Metals
   · DFARS xx.xx-xx.xx requires specialty metal delivered under the covered contract to be melted or produced in the United States or its outlying areas. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-specialty-metals.))

5.9. Return on Investment & Cost-Benefit Analysis

For a component buyer, a stocking arrangement can justify commitment when dependable allocation and release administration reduce disruption exposure enough to outweigh inventory funding, storage, and unused-material obligations. Customer-held and supplier-held programs change where inventory sits, not automatically who owns it or bears schedule risk. [redacted]

For a material supplier, dedicated coverage or investment is more defensible when supported by an attributable customer commitment than by general aerospace activity. [redacted] ATI Inc.'s distinction between multiyear terms and accepted orders shows why relationship duration alone is insufficient.

Residual cost recovery is a separate sensitivity. ATI discloses that surcharge and index mechanisms can recover costs incompletely or with delay. [redacted]

Sources & Evidence

1. ATI 2025 Annual Report
   · ATI says longer agreements reduce supply uncertainty but discloses delayed or incomplete recovery through surcharge and index mechanisms. These facts support assessing commitment coverage and residual funding exposure separately. ([s27.q4cdn.com](https://s27.q4cdn.com/xx.xx/files/doc_financials/2025/ar/ATI-2025-Annual-Report-web-FINAL.pdf))
2. Rolled Alloys - E-Services Stocking Programs
   · Customer-site and supplier-held arrangements provide distinct inventory-location choices. Ownership, allocation, unused-material responsibility, and economic benefits require an order-specific agreement. ([rolledalloys.com](https://www.rolledalloys.com/eservices/))

3. Rolled Alloys - U.S. Terms and Conditions of Sale, May 6, 2026

   · Rolled Alloys' U.S. terms describe estimated shipping dates, transfer of transit risk at carrier delivery, limited warranty remedies, and exclusion of consequential damages. Negotiated written terms can alter the applicable relationship. ([rolledalloys.com](https://www.rolledalloys.com/wp-content/uploads/2022/xx.xx/Rolled_Alloys_Sales_Terms_US.pdf))

4. Doncasters Group - DPC Holdings Reports Strong Second Quarter 2026 Results

   · The disclosed customer partnership connects the Alabama project to purchasing commitments. It supports commitment-backed investment as a commercial precedent, not evidence of access for an unrelated buyer. ([ir.doncasters.com](https://ir.doncasters.com/news-and-events/news/news-details/2026/DPC-Holdings-Reports-Strong-Second-Quarter-2026-Results/default.aspx))

6. Cumulative Impact of Artificial Intelligence 2026

AI has a documented downstream planning role that may affect superalloy purchasing timing. ■■ ■■■■■■■■■ ■■■■■■■ ■■■■■■■■■ ■■ ■■ ■■■■■■■■ ■■■■■■■■■ ■■ ■■■ ■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■■■■ ■■ ■■■■ ■■ ■■■■■■■■■■ ■■■■ ■■■■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■ ■■■■■ ■■■■■■■■■ ■■■■ ■■■■■■■■■■■ ■■■■■■■■ ■■■ ■■ ■■■■■■ ■■■■■■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■■■ ■■ ■■■■■■■■■■■■ ■■■■■■■■■■■■■ Component manufacturers and material suppliers could benefit from shared planning signals only when they identify an attributable requirement and distinguish forecasts from purchasing commitments; the direction of new-material demand still depends on the workscope.

■■■■■■■■ ■■■■■■■■■■ ■■■ ■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■■■■■■■ ■■■■ ■■■ ■■■■■ ■■■■■■ ■■■■■■■■ ■■■■■■■■■■ ■■ ■■■■■■■■ ■■■■■■■■■■ ■■■ ■■■■■ ■■■■■■■■■■■■ ■■■ ■■■■■■■■ ■■■ ■■ ■■■■■■■■■■ ■■■■ ■■■ ■■■■■■■■ ■■ ■■■■■ ■ ■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■ ■■ ■■■■■■■■ ■■■■■■■■ ■■■■ ■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■■■■■■■■■ ■■■■■■■■ ■■■ ■■■■■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■ ■■■■■■■■■■■■ Procurement and quality staff would still need to reconcile outputs with authorized business records. The supported commercial effect is a combination of potential planning visibility and additional governance obligations, not demonstrated removal of purchasing labor or universal material-order gains.

Sources & Evidence

1. GE Aerospace - 2025 Annual Report CEO Letter
   - GE Aerospace reports deploying an AI material assistant at its Celma and Malaysia MRO facilities in 2025 to anticipate LEAP workscopes and support earlier parts ordering. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_2025ceoletter.pdf))
2. Rolls-Royce Notice to Suppliers 632 - Supplier Minimum Cyber Security Standards, July 18, 2025
   - Rolls-Royce's July xx.xx 2025 supplier notice requires applicable AI security compliance and prior notification and approval for AI connected with its business or data. ([suppliers.rolls-royce.com](https://suppliers.rolls-royce.com/GSPWeb/ShowProperty?nodePath=%2FBEA+Repository%2FGlobal+Supplier+Portal%2FNoticesToSuppliers%2Fnts_632%2F%2FntsFile))

7. Nickel-Based Superalloys for Aerospace Market, by Product Form

Product Form changes the relevant sourcing comparison, not merely the material description. ■■■ ■■■■■ ■■■■ ■■■■■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■■■■■ ■■■■ ■■■■ ■■■■ ■■■■■■■■ ■■■ ■■■ ■■■ ■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■ ■■■■■■■ ■■■ ■■■■■ ■■■■■■■■■■ ■■■■■■ ■■■■■■ ■■ ■■■■■ ■■■■ ■■■ ■■■■■■■■■ ■■■■■■ ■■■■■■ ■■■■■ ■■■ ■■■■■ ■■■■■ ■■■ ■■■■■ ■■■ ■■■■■ ■■■■■■ ■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■ ■■■■■■■ ■■■ ■■■■■■■■ ■■■■ ■■■■■■ ■■■■ ■■■■■■ ■■■■ ■ ■■■■■■ ■■■■■ ■■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■■■■ Special Metals advertises several of these forms, but its portfolio description does not establish every grade-form combination or an order-specific commitment.

For Ingots and Billets and Forging Stock, buyers must also distinguish the material transaction from the downstream component award. DPC Holdings' April 2026 draft disclosure describes Doncasters supplying superalloy ingots externally alongside internal material supply to its casting businesses. ■ ■■■■■■■ ■■■■■■■■■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■■■ ■■■■ ■■■ ■■■■■■■■■ ■■■ ■■■■■ ■■ ■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■ ■■■■■■■■■■■ ■■■■■■ ■■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■■■ ■■■■■■ ■■■■■■■ ■■ ■■■ ■■■■■■■■■■■■■

Powder has identifiable commercial offerings without constituting an exclusive supplier category. ■■■■■■ ■ ■■■■■ ■■■■■ ■■■■■■■■■■ ■■■■■■■ ■■■■■ ■■■■■■ ■■■■■■■■■■ ■■■■■■ ■■■ ■■ ■■■■■■ ■■■ ■■■■■■■■■■■■ ■■■■■ ■■■■■■ ■■■■ ■■■ ■■■■■ ■■■■■■■■ ■■■■ ■■■■■■■■■ ■■ ■■■■■■■■ ■■■■■■■■■ ■■■■■ ■■■■■■ ■■■■ ■■■■■■■■ ■■ ■■■■■■■■■■■■ ■■■■■■■ ■■ ■■■■■■■■ ■■■■■ ■■ ■ ■■■■■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■ An alternative stock offer becomes useful only when its form and documentation meet the actual purchasing requirement; apparent availability alone does not justify switching.

Figure 8. Global Nickel-Based Superalloys for Aerospace Market Size, by Product Form, 2025 (%)

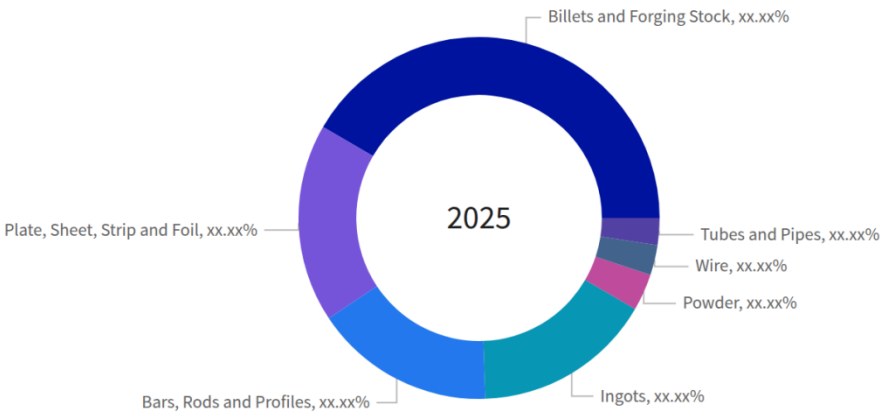

Figure 9. Global Nickel-Based Superalloys for Aerospace Market, by Product Form, 2032 (USD Million)

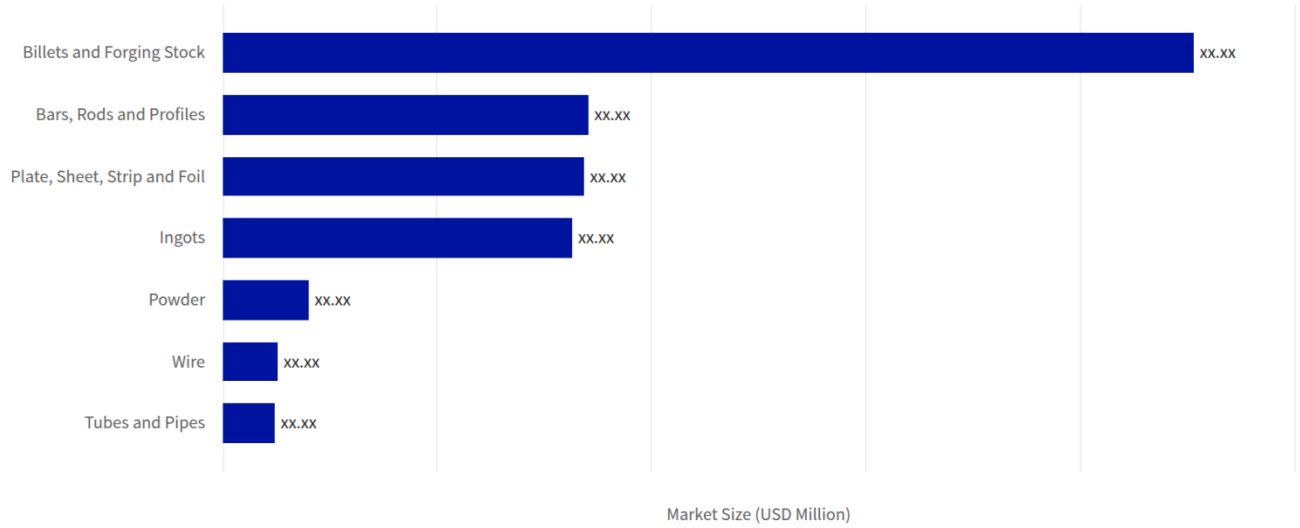

Table 4. Global Nickel-Based Superalloys for Aerospace Market, by Product Form growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Bars, Rods and Profiles	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Billets and Forging Stock	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ingots	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Plate, Sheet, Strip and Foil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Powder	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Tubes and Pipes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Wire	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 5. Global Nickel-Based Superalloys for Aerospace Market Size, by Product Form, 2017-2040 (USD Million)

Product Form	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Bars, Rods and Profiles	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Billets and Forging Stock	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ingots	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Plate, Sheet, Strip and Foil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Powder	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Tubes and Pipes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Wire	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Special Metals - Tech Center

   · Special Metals advertises ingots, billets, plate, sheet, strip, tubing, bar, and wire. This establishes advertised form breadth, not every grade-form combination or a particular fulfillment obligation. ([specialmetals.com](https://www.specialmetals.com/tech-center/))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised ingot supply establishes a PCC material-form crosswalk, not its sales weight.

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised billet supply supports the forging-stock category mapping within the inherited PCC envelope.

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised bar supply supports classification only; the monetary coefficient is an assumption.

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Plate, sheet and strip offerings support a distinct flat-product allocation premise.

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire availability supports the material-form crosswalk without establishing revenue.

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Tubing availability supports the material-form crosswalk without establishing revenue.

2. Boeing BDS Terms and Conditions Guide - D607 Material Substitution Prohibition

   · Boeing D607 treats unauthorized departures from the required material definition, including form, as prohibited substitutions and makes authorized deviations specific to the purchase contract. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))

3. CMA - Anticipated Acquisition by Acerinox, S.A. of Haynes International, Inc.: Full Text Decision
   - The CMA's 2024 investigation distinguished flat and long nickel products, identified shape-specific purchasing, and did not establish separate competitive markets for every sub-shape. Its reviewed market is broader than aerospace superalloys alone. ([assets.publishing.service.gov.uk](https://assets.publishing.service.gov.uk/media/67370ebb65b6c2f3313e5d39/__Full_text_decision___.pdf))
   - Taxonomy evidence: The decision distinguishes shape, grade, and material specification as separate nickel-alloy descriptors. These broader-market classifications support distinct analytical questions, not a finding that every retained category is a separate competitive market. ([assets.publishing.service.gov.uk](https://assets.publishing.service.gov.uk/media/67370ebb65b6c2f3313e5d39/__Full_text_decision___.pdf))
   - Taxonomy evidence: Paragraphs xx.xx-xx.xx report customer purchasing distinctions between flat and long nickel products and shape-specific demand. The investigation did not establish separate competitive markets for every sub-shape; its findings are not global aerospace demand allocations. ([assets.publishing.service.gov.uk](https://assets.publishing.service.gov.uk/media/67370ebb65b6c2f3313e5d39/__Full_text_decision___.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct customer evidence in paragraphs xx.xx-xx.xx supports separate flat/long purchasing pools; no published market-share table is used.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Shape-specific purchasing supports a distinct long-stock allocation model without proving a separate competitive market for billet.
4. DPC Holdings Limited - Draft Registration Statement, April 14, 2026
   - DPC Holdings' April xx.xx 2026 draft registration statement describes Doncasters' superalloy ingots, internal supply to casting facilities, and external supply to aerospace and industrial-gas-turbine customers. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Taxonomy evidence: The business record distinguishes superalloy ingots from downstream structural castings and airfoils, supporting the analytical separation of supplied alloy material from component sales value. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing separates ingots from component sales and describes external supply and xx.xx% internal superalloy sourcing, contradicting the inherited xx.xx% captive parameter.
5. Aubert & Duval - Stellar ABD-1000AM Powder for Additive Manufacturing
   - Aubert & Duval lists ABD-1000AM as a nickel-based powder offering associated with aerospace applications; the page does not establish an individual customer's acceptance or order commitment. ([aubertduval.com](https://www.aubertduval.com/en/products/stellar-abd-1000am-powder-for-additive-manufacturing/))
6. Haynes International - HAYNES 282
   - Haynes advertises Haynes xx.xx across flat, long, tubular, ingot, billet, and powder forms, supporting a comparison that does not equate powder with a unique producer category. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Powder is offered alongside conventional forms for HAYNES xx.xx supporting nonexclusive form classification, not an observed sales allocation.
7. Customs Tariff 2026 - Chapter 75: Nickel and Articles Thereof
   - Taxonomy evidence: Chapter xx.xx separately recognizes unwrought nickel alloys, powders, long products, wire, flat products and tubular products. These classifications cover a wider material boundary than aerospace superalloys. ([cbsa-asfc.gc.ca](https://www.cbsa-asfc.gc.ca/trade-commerce/tariff-tarif/2026/xx.xx-xx.xx/ch75-2026-eng.pdf))

8. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC's reported financial/product-category inputs and listed ingot offering constrain the eligible material envelope; the ingot allocation remains assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: AA&S sales of USD xx.xx and its xx.xx% nickel-based/specialty-alloy category anchor the separately adjusted rolled-material envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
9. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
10. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Narrow-strip supply supports a limited flat-product allocation within the modeled eligible Carpenter envelope.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire is a disclosed supplied form; its eligible monetary weight remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.

11. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical xx.xx% slab/bar/billet revenue category constrains the long-stock proxy; its eligible billet split is assumed.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported combined stock category provides a proxy anchor, not a separately disclosed bar revenue share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 flat products represented approximately xx.xx% of net product revenue; extrapolation to the eligible Acerinox envelope is modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 wire represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 tubulars represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
12. Howmet Aerospace Inc. - 2025 Form 10-K
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Casting-alloy activities support an ingot-material equivalent rather than attributing full engine-component revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed metal/billet activities support retaining a forging-stock allocation; the assumed xx.xx% weight is not reported.
13. GE Aerospace - 2025 Sustainability Report
    - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
    - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
    - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
14. Acerinox - Results FY 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned US long-product expansion supports the relative conventional-long-material premise; investment is not recognized as sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately USD xx.xx of planned platform investment includes expansion of the long-products offering, informing the bars forecast premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace demand and planned long-product diversification support testing a relative mix shift without assuming flat-product contraction.

7.1. Billets and Forging Stock

Table 6. Global Nickel-Based Superalloys for Aerospace Market Size, by Billets and Forging Stock, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 7. Global Nickel-Based Superalloys for Aerospace Market Size, by Billets and Forging Stock, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 8. Global Nickel-Based Superalloys for Aerospace Market Size, by Billets and Forging Stock, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Anticipated acquisition by Acerinox, S.A. of Haynes International, Inc. - Full text decision

   · Taxonomy evidence: Paragraph xx.xx identifies billets among commercial nickel-product shapes, alongside bars, wires and tubes. ([assets.publishing.service.gov.uk](https://assets.publishing.service.gov.uk/media/67370ebb65b6c2f3313e5d39/__Full_text_decision___.pdf))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Shape-specific purchasing supports a distinct long-stock allocation model without proving a separate competitive market for billet.

2. ASTM B637-26 - Precipitation-Hardening and Cold Worked Nickel Alloy Bars, Forgings, and Forging Stock

   · Taxonomy evidence: The public scope distinguishes forging stock from finished forgings within its nickel-alloy material coverage. ([store.astm.org](https://store.astm.org/standards/b637))

3. SAE AMS5670H - Nickel Alloy Bars, Forgings, Rings and Stock for Rings, Forgings and Heading

   · Taxonomy evidence: The aerospace-material scope separately includes stock for forging, rings or heading, supporting a material-stock distinction from component-specific forgings. ([saemobilus.sae.org](https://saemobilus.sae.org/standards/ams5670h-nickel-alloy-corrosion-heat-resistant-bars-forgings-and-rings-stock-rings-forgings-heading-72ni-155cr-095cb-nb-25ti-070al-70fe-x750-xx.xx-f-xx.xx-c-solution-heat-treated-precipitation-hardenable))

4. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
5. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
6. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
7. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical xx.xx% slab/bar/billet revenue category constrains the long-stock proxy; its eligible billet split is assumed.
8. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed metal/billet activities support retaining a forging-stock allocation; the assumed xx.xx% weight is not reported.

9. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
11. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
12. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
13. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

14. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
15. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
16. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
17. Special Metals - Tech Center
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised billet supply supports the forging-stock category mapping within the inherited PCC envelope.
18. Acerinox - Results FY 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned US long-product expansion supports the relative conventional-long-material premise; investment is not recognized as sales.

7.2. Plate, Sheet, Strip and Foil

Table 9. Global Nickel-Based Superalloys for Aerospace Market Size, by Plate, Sheet, Strip and Foil, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 10. Global Nickel-Based Superalloys for Aerospace Market Size, by Plate, Sheet, Strip and Foil, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 11. Global Nickel-Based Superalloys for Aerospace Market Size, by Plate, Sheet, Strip and Foil, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Anticipated acquisition by Acerinox, S.A. of Haynes International, Inc. - Full text decision

   · Taxonomy evidence: Footnote xx.xx states that the industry has no single plate-versus-sheet delineation, supporting the retained combined flat-product category rather than a universal dimensional split. ([assets.publishing.service.gov.uk](https://assets.publishing.service.gov.uk/media/67370ebb65b6c2f3313e5d39/__Full_text_decision___.pdf))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct customer evidence in paragraphs xx.xx-xx.xx supports separate flat/long purchasing pools; no published market-share table is used.

2. Customs Tariff 2026 - Chapter 75: Nickel and Articles Thereof

   · Taxonomy evidence: Heading xx.xx groups plate, sheet, strip and foil, with a distinct nickel-alloy subdivision. ([cbsa-asfc.gc.ca](https://www.cbsa-asfc.gc.ca/trade-commerce/tariff-tarif/2026/xx.xx-xx.xx/ch75-2026-eng.pdf))

3. SAE MAM5914 - Nickel Alloy, Corrosion and Heat Resistant, Sheet, Strip, and Foil

   · Taxonomy evidence: The public aerospace-material scope recognizes sheet, strip and foil as supplied forms within a nickel-alloy material family. This supports category recognition, not current sales or a universal dimensional crosswalk. ([saemobilus.sae.org](https://saemobilus.sae.org/standards/mam5914-nickel-alloy-corrosion-heat-resistant-sheet-strip-foil-525ni-19cr-30mo-50cb-090ti-050al-18fe-consumable-electrode-vacuum-induction-melted-precision-cold-rolled-solution-heat-treated))

4. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: AA&S sales of USD xx.xx and its xx.xx% nickel-based/specialty-alloy category anchor the separately adjusted rolled-material envelope.
5. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
6. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Narrow-strip supply supports a limited flat-product allocation within the modeled eligible Carpenter envelope.
7. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 flat products represented approximately xx.xx% of net product revenue; extrapolation to the eligible Acerinox envelope is modeled.
8. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
9. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.

10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
11. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
12. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
13. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

14. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
15. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
16. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
17. Special Metals - Tech Center
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Plate, sheet and strip offerings support a distinct flat-product allocation premise.
18. Acerinox - Results FY 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace demand and planned long-product diversification support testing a relative mix shift without assuming flat-product contraction.

7.3. Bars, Rods and Profiles

Table 12. Global Nickel-Based Superalloys for Aerospace Market Size, by Bars, Rods and Profiles, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 13. Global Nickel-Based Superalloys for Aerospace Market Size, by Bars, Rods and Profiles, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 14. Global Nickel-Based Superalloys for Aerospace Market Size, by Bars, Rods and Profiles, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Customs Tariff 2026 - Chapter 75: Nickel and Articles Thereof
   - Taxonomy evidence: Subheading xx.xx separately identifies nickel-alloy bars, rods and profiles. ([cbsa-asfc.gc.ca](https://www.cbsa-asfc.gc.ca/trade-commerce/tariff-tarif/2026/xx.xx-xx.xx/ch75-2026-eng.pdf))
2. ASTM B637-26 - Precipitation-Hardening and Cold Worked Nickel Alloy Bars, Forgings, and Forging Stock
   - Taxonomy evidence: The specification expressly covers nickel-alloy rod and bar as supplied material forms. ([store.astm.org](https://store.astm.org/standards/b637))
3. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.

4. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
5. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
6. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported combined stock category provides a proxy anchor, not a separately disclosed bar revenue share.
7. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
8. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.

9. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
10. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
11. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
12. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

13. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
14. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
15. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
16. Special Metals - Tech Center
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised bar supply supports classification only; the monetary coefficient is an assumption.
17. Acerinox - Results FY 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately USD xx.xx of planned platform investment includes expansion of the long-products offering, informing the bars forecast premise.

7.4. Ingots

Table 15. Global Nickel-Based Superalloys for Aerospace Market Size, by Ingots, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 16. Global Nickel-Based Superalloys for Aerospace Market Size, by Ingots, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 17. Global Nickel-Based Superalloys for Aerospace Market Size, by Ingots, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. DPC Holdings Limited - Draft Registration Statement, April 14, 2026

   · Taxonomy evidence: The publicly accessible April xx.xx 2026 registration-statement record identifies nickel- and cobalt-based superalloy ingots and separately describes ingot supply for aerospace customers. Together with the regulatory form classification, this corroborates ingots as an aerospace material category; mixed-base-metal disclosures do not provide a nickel-only allocation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing separates ingots from component sales and describes external supply and xx.xx% internal superalloy sourcing, contradicting the inherited xx.xx% captive parameter.

2. Customs Tariff 2026 - Chapter 75: Nickel and Articles Thereof

   · Taxonomy evidence: Heading xx.xx recognizes unwrought nickel alloys, providing a broader material-form crosswalk rather than direct aerospace-ingot verification. ([cbsa-asfc.gc.ca](https://www.cbsa-asfc.gc.ca/trade-commerce/tariff-tarif/2026/xx.xx-xx.xx/ch75-2026-eng.pdf))

3. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC's reported financial/product-category inputs and listed ingot offering constrain the eligible material envelope; the ingot allocation remains assumed.
4. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
5. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
6. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
7. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Casting-alloy activities support an ingot-material equivalent rather than attributing full engine-component revenue.
8. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.

9. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
10. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
11. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
12. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

13. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
14. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
15. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
16. Special Metals - Tech Center
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised ingot supply establishes a PCC material-form crosswalk, not its sales weight.

7.5. Powder

Table 18. Global Nickel-Based Superalloys for Aerospace Market Size, by Powder, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 19. Global Nickel-Based Superalloys for Aerospace Market Size, by Powder, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 20. Global Nickel-Based Superalloys for Aerospace Market Size, by Powder, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. SAE AMS7075 - Nickel Alloy, Corrosion- and Heat-Resistant, Powder for Additive Manufacturing
   · Taxonomy evidence: The public scope of AMS7075, issued January xx.xx 2026, explicitly covers a corrosion- and heat-resistant nickel alloy supplied as prealloyed powder. This adds a current aerospace-material-standard anchor for the powder form without asserting a proprietary-grade equivalence not stated on the page. ([saemobilus.sae.org](https://saemobilus.sae.org/standards/ams7075-nickel-alloy-corrosion-heat-resistant-powder-additive-manufacturing-50ni-20co-17cr-31w-23ti-21al-21mo-18cb-nb-15ta-004c-0005b))
2. Customs Tariff 2026 - Chapter 75: Nickel and Articles Thereof
   · Taxonomy evidence: Heading xx.xx separately recognizes nickel powder products. It does not isolate the aerospace-superalloy subset. ([cbsa-asfc.gc.ca](https://www.cbsa-asfc.gc.ca/trade-commerce/tariff-tarif/2026/xx.xx-xx.xx/ch75-2026-eng.pdf))
3. SAE AMS7006 - Nickel Alloy, Corrosion- and Heat-Resistant, Powder for Additive Manufacturing
   · Taxonomy evidence: The aerospace-material specification recognizes supplied nickel-alloy powder for additive manufacturing as a material category distinct from finished components. No technical production conditions are used for segmentation. ([saemobilus.sae.org](https://saemobilus.sae.org/standards/ams7006-nickel-alloy-corrosion-heat-resistant-powder-additive-manufacturing-525ni-19cr-30mo-51cb-nb-090ti-050al-18fe))
4. ATI Inc. - 2025 Form 10-K
   · Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
5. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   · Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
6. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   · Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.
   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.

7. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
8. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
9. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
11. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.

12. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
13. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.
14. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
15. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
16. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
17. Haynes International - HAYNES 282
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Powder is offered alongside conventional forms for HAYNES xx.xx supporting nonexclusive form classification, not an observed sales allocation.

7.6. Wire

Table 21. Global Nickel-Based Superalloys for Aerospace Market Size, by Wire, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 22. Global Nickel-Based Superalloys for Aerospace Market Size, by Wire, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 23. Global Nickel-Based Superalloys for Aerospace Market Size, by Wire, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Customs Tariff 2026 - Chapter 75: Nickel and Articles Thereof
   · Taxonomy evidence: Subheading xx.xx distinguishes nickel-alloy wire from bars, rods and profiles. ([cbsa-asfc.gc.ca](https://www.cbsa-asfc.gc.ca/trade-commerce/tariff-tarif/2026/xx.xx-xx.xx/ch75-2026-eng.pdf))
2. SAE AMS5832E - Nickel Alloy, Corrosion and Heat Resistant, Welding Wire
   · Taxonomy evidence: The inspected historical revision's public scope recognizes corrosion- and heat-resistant nickel-alloy welding wire as a supplied material form. It does not establish current customer qualification or sales. ([saemobilus.sae.org](https://saemobilus.sae.org/standards/ams5832e-nickel-alloy-corrosion-heat-resistant-welding-wire-525ni-19cr-30mo-51cb-090ti-050al-18fe-consumable-electrode-vacuum-induction-melted))

3. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
4. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
5. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire is a disclosed supplied form; its eligible monetary weight remains modeled.
6. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 wire represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
7. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
8. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.

9. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
10. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
11. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
12. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

13. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
14. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
15. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
16. Special Metals - Tech Center
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire availability supports the material-form crosswalk without establishing revenue.

7.7. Tubes and Pipes

Table 24. Global Nickel-Based Superalloys for Aerospace Market Size, by Tubes and Pipes, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 25. Global Nickel-Based Superalloys for Aerospace Market Size, by Tubes and Pipes, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 26. Global Nickel-Based Superalloys for Aerospace Market Size, by Tubes and Pipes, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Customs Tariff 2026 - Chapter 75: Nickel and Articles Thereof

   · Taxonomy evidence: Subheading xx.xx identifies nickel-alloy tubes and pipes separately from fittings. ([cbsa-asfc.gc.ca](https://www.cbsa-asfc.gc.ca/trade-commerce/tariff-tarif/2026/xx.xx-xx.xx/ch75-2026-eng.pdf))

2. SAE AMS5589H - Nickel Alloy, Corrosion- and Heat-Resistant, Seamless Tubing
   - Taxonomy evidence: The March 2026 aerospace-material specification explicitly recognizes Inconel xx.xx seamless tubing, directly connecting a tubular material form to an in-scope nickel-superalloy identity. ([saemobilus.sae.org](https://saemobilus.sae.org/standards/ams5589h-nickel-alloy-corrosion-heat-resistant-seamless-tubing-525ni-19cr-30mo-51cb-nb-090ti-050al-18fe-inconel-xx.xx-consumable-electrode-remelted-vacuum-induction-melted-xx.xx-f-xx.xx-c-solution-heat-treated))
3. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
4. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
5. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
6. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 tubulars represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
7. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.

8. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
9. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
10. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
11. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
12. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

13. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
14. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
15. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
16. Special Metals - Tech Center
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Tubing availability supports the material-form crosswalk without establishing revenue.

8. Nickel-Based Superalloys for Aerospace Market, by Strengthening Class

Strengthening Class distinguishes material requirements rather than separate supplier tiers. [illegible] Where contractual substitution controls apply, moving to another class requires the relevant authorization rather than a general performance comparison.

[illegible] Before treating this class as a sourcing alternative, buyers need a named supplier's applicable offering and fulfillment commitment. Historical pedigree supports investigation, not an unconditional material commitment.

Figure 10. Global Nickel-Based Superalloys for Aerospace Market Size, by Strengthening Class, 2025 (%)

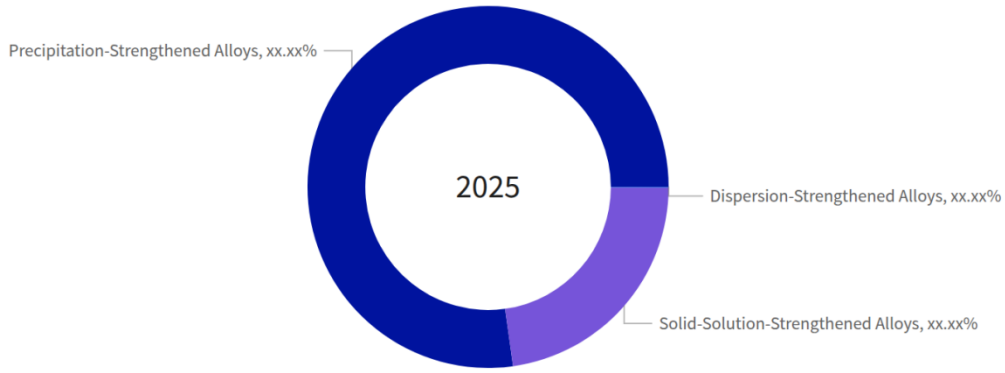

Figure 11. Global Nickel-Based Superalloys for Aerospace Market, by Strengthening Class, 2032 (USD Million)

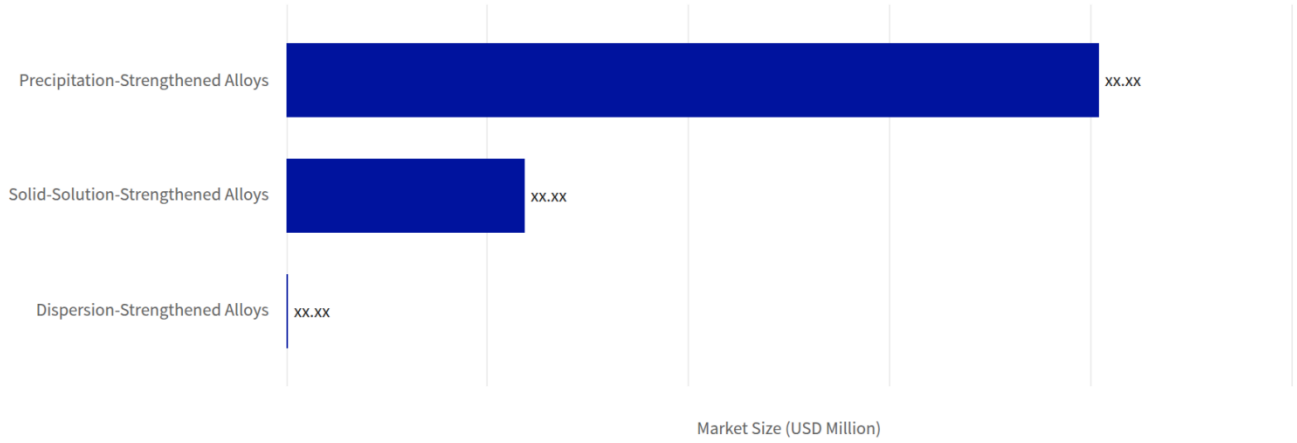

Table 27. Global Nickel-Based Superalloys for Aerospace Market, by Strengthening Class growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Dispersion-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Precipitation-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Solid-Solution-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 28. Global Nickel-Based Superalloys for Aerospace Market Size, by Strengthening Class, 2017-2040 (USD Million)

Strengthening Class	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Dispersion-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Precipitation-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Solid-Solution-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Special Metals - Aerospace

   · Special Metals' undated aerospace portfolio lists INCONEL alloy MA754. The listing does not state an order-specific form, continuing delivery commitment, or customer acceptance. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

2. Boeing BDS Terms and Conditions Guide - D607 Material Substitution Prohibition

   · The clause recognizes authorized alternatives but does not permit an unapproved material change, grounding the conditional treatment of cross-class sourcing rather than an assumption of interchangeability. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: D607 prohibits unauthorized material substitutions while recognizing specified alternatives. It constrains assumptions about frictionless cross-class substitution, without quantifying adoption delays. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization requirements qualify assumptions about precipitation-family substitution opportunities; the clause does not prove future purchases or a class-growth premium. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))

3. Haynes International - HAYNES 282

   · Haynes describes Haynes xx.xx as gamma-prime strengthened, discusses its precipitation strengthening, and positions it for high-temperature structural applications including aeroengines. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))

4. Haynes International - HAYNES 230
   - Haynes identifies Haynes xx.xx as solid-solution-strengthened and describes combustion-hardware applications. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
5. NASA - Welding and Brazing of Nickel and Nickel-Base Alloys: Public Abstract
   - The public abstract distinguishes solid-solution, precipitation, and dispersion-hardening nickel-base families. Only this historical classification is used, not the document's operational subject matter. ([ntrs.nasa.gov](https://ntrs.nasa.gov/citations/xx.xx))
   - Taxonomy evidence: The public abstract distinguishes solid-solution-hardening, precipitation-hardening and dispersion-hardening nickel-base alloy families. Its broader high-nickel nonheat-treatable category is not adopted because the report boundary is structural superalloys. ([ntrs.nasa.gov](https://ntrs.nasa.gov/citations/xx.xx))
6. NASA - Longitudinal Shear Behavior of Several Oxide Dispersion Strengthened Alloys: Public Abstract
   - NASA's 1978 abstract identifies MA-xx.xx and MA-xx.xx as commercial oxide-dispersion-strengthened alloys. This establishes historical commercial recognition, not continuing aerospace deliveries. ([ntrs.nasa.gov](https://ntrs.nasa.gov/citations/xx.xx))
7. Materials Needs and R&D Strategy for Future Military Aerospace Propulsion Systems - Appendix E
   - Taxonomy evidence: The aerospace-propulsion case study distinguishes solid-solution and precipitation strengthening within its nickel-superalloy discussion. It supports an alloy-family axis separate from delivered product form. ([nationalacademies.org](https://www.nationalacademies.org/read/xx.xx/chapter/xx.xx))
8. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))

9. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
10. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
11. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
12. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
13. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.

14. Carpenter Technology - Advanced Materials for Aerospace Motor & Engines

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation.
([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation.
([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))

15. Elementum 3D - Metal Alloy Additive Manufacturing Colorado

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed.
([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed.
([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))

16. NASA - NASA-Developed Printable Metal Can Take the Heat

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake.
([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake.
([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

17. Carpenter Technology - Lighter, Faster, Stronger Metallurgy for Defense, July 2025

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

8.1. Precipitation-Strengthened Alloys

Table 29. Global Nickel-Based Superalloys for Aerospace Market Size, by Precipitation-Strengthened Alloys, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 30. Global Nickel-Based Superalloys for Aerospace Market Size, by Precipitation-Strengthened Alloys, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 31. Global Nickel-Based Superalloys for Aerospace Market Size, by Precipitation-Strengthened Alloys, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. ASTM B637-26 - Precipitation-Hardening and Cold Worked Nickel Alloy Bars, Forgings, and Forging Stock
   · Taxonomy evidence: The public scope recognizes precipitation-hardenable nickel alloys intended for moderate- or high-temperature service. ([store.astm.org](https://store.astm.org/standards/b637))
2. SAE AMS5670H - Nickel Alloy Bars, Forgings, Rings and Stock for Rings, Forgings and Heading
   · Taxonomy evidence: The specification identifies X750 as precipitation-hardenable despite its stated delivered condition, supporting separation of alloy family from delivery temper. ([saemobilus.sae.org](https://saemobilus.sae.org/standards/ams5670h-nickel-alloy-corrosion-heat-resistant-bars-forgings-and-rings-stock-rings-forgings-heading-72ni-155cr-095cb-nb-25ti-070al-70fe-x750-xx.xx-f-xx.xx-c-solution-heat-treated-precipitation-hardenable))
3. Materials Needs and R&D Strategy for Future Military Aerospace Propulsion Systems - Appendix E
   · Taxonomy evidence: The case study explicitly recognizes precipitation strengthening as a nickel-superalloy classification distinction. ([nationalacademies.org](https://www.nationalacademies.org/read/xx.xx/chapter/xx.xx))
4. Welding and Brazing of Nickel and Nickel-Base Alloys
   · Taxonomy evidence: The abstract identifies precipitation-hardening nickel-base alloys and explicitly connects them to aerospace applications. ([ntrs.nasa.gov](https://ntrs.nasa.gov/citations/xx.xx))

5. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
6. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
7. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
8. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
9. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.

10. GE Aerospace - 2025 Sustainability Report
    - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
    - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
    - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
11. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
12. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
13. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
14. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

15. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
16. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
17. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
18. Haynes International - HAYNES 282
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification.
      ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification.
      ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
19. Carpenter Technology - Advanced Materials for Aerospace Motor & Engines
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation.
      ([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation.
      ([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))

20. Boeing - BDS Terms and Conditions Guide, D607 Material Substitution Prohibition, November 15, 2013
· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization requirements qualify assumptions about precipitation-family substitution opportunities; the clause does not prove future purchases or a class-growth premium. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))

8.2. Solid-Solution-Strengthened Alloys

Table 32. Global Nickel-Based Superalloys for Aerospace Market Size, by Solid-Solution-Strengthened Alloys, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 33. Global Nickel-Based Superalloys for Aerospace Market Size, by Solid-Solution-Strengthened Alloys, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 34. Global Nickel-Based Superalloys for Aerospace Market Size, by Solid-Solution-Strengthened Alloys, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Materials Needs and R&D Strategy for Future Military Aerospace Propulsion Systems - Appendix E
   · Taxonomy evidence: The case study explicitly recognizes solid-solution-strengthened nickel material within the superalloy discussion.
   ([nationalacademies.org](https://www.nationalacademies.org/read/xx.xx/chapter/xx.xx))
2. Welding and Brazing of Nickel and Nickel-Base Alloys
   · Taxonomy evidence: The abstract separately recognizes the solid-solution-hardening nickel-base alloy family.
   ([ntrs.nasa.gov](https://ntrs.nasa.gov/citations/xx.xx))

3. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
4. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
5. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
6. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))

7. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
8. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
9. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
10. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
11. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
12. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

13. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
14. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
15. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
16. Haynes International - HAYNES 230
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
17. Boeing - BDS Terms and Conditions Guide, D607 Material Substitution Prohibition, November 15, 2013
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: D607 prohibits unauthorized material substitutions while recognizing specified alternatives. It constrains assumptions about frictionless cross-class substitution, without quantifying adoption delays. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))

8.3. Dispersion-Strengthened Alloys

Table 35. Global Nickel-Based Superalloys for Aerospace Market Size, by Dispersion-Strengthened Alloys, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 36. Global Nickel-Based Superalloys for Aerospace Market Size, by Dispersion-Strengthened Alloys, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 37. Global Nickel-Based Superalloys for Aerospace Market Size, by Dispersion-Strengthened Alloys, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Welding and Brazing of Nickel and Nickel-Base Alloys

   · Taxonomy evidence: The abstract recognizes dispersion-hardening nickel-base material as a distinct elevated-temperature family. This historical classification does not establish contemporary sales. ([ntrs.nasa.gov](https://ntrs.nasa.gov/citations/xx.xx))

2. Longitudinal Shear Behavior of Several Oxide Dispersion Strengthened Alloys

   · Taxonomy evidence: NASA's August 1978 record explicitly distinguishes commercial oxide-dispersion-strengthened alloys from experimental variants in turbine-related materials research. It supports historical commercial recognition, not present aerospace deliveries or recurring supply. ([ntrs.nasa.gov](https://ntrs.nasa.gov/citations/xx.xx))

3. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
4. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
5. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
6. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
7. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
8. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.

9. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
10. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
11. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
12. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

13. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
14. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
15. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
16. Elementum 3D - Metal Alloy Additive Manufacturing Colorado
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed. ([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed. ([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))
17. NASA - NASA-Developed Printable Metal Can Take the Heat
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake. ([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake. ([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

18. Carpenter Technology - Lighter, Faster, Stronger Metallurgy for Defense, July 2025

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

19. Special Metals - Aerospace

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight.
([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight.
([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

9. Nickel-Based Superalloys for Aerospace Market, by Component Application

Within Air-Breathing Propulsion & Auxiliary Power, component identity can change the purchasing cycle. ■■■ ■■■■■■■■■ ■■■■■ ■■■■■ ■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■ ■■■■■■■■■■ ■■■■■■■■ ■■ ■■■■■■■■■ ■■■■■■■ ■■■■■■■■■ ■■■■■■■ ■■■ ■■■■■■■■■ ■■■■■■■■■■ ■■■ ■■■ ■■■■■■■■■ ■■■■■■ ■■■■■ ■■■ ■■■■■■■ ■■■■■■■■■ ■■■■■■■ ■■■■■■■■■ ■■■■■ ■■■ ■■■■■■■■■■■■ ■■■■■■■■■■ This company-specific distinction makes Turbine Blades & Vanes and Engine Structures & Auxiliary Systems different commercial questions; it does not establish a universal replacement pattern or an external material award.

Turbine Disks & Rotor Hardware, Compressor Components, and Combustion & Exhaust Components also require separate material attribution. ■■■■■■ ■■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■ ■■■■■■■■■■■■■■ ■■■■■ ■■■■■ ■■■■■ ■■■■■■■ ■■■■■■■■■■■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■■ ■ ■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■ ■■■■ ■■■■■■■■ ■■ ■■■■■ ■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■■■■■■■■ ■■■■■■■■■■■■■ ■■■■ ■■■■■■■■ ■■ ■■■■ ■■ ■■■ ■■■ ■■■■■■■■■ ■ ■■■■ ■■■■■■■■ ■■■■■■■■ ■■ ■■■■ ■■■■■■■■■■ ■■■■■■■■■■ ■ ■■■■ ■ ■■■■■■ ■■■■■■■■■■■■■■■ ■■■■■■■■■■■■■ ■■■ ■■■■ ■■■■■■■■■■■ ■■■■■■■ ■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■■■■■■ A supplier's aircraft-engine credentials should not be treated as proof of access to every component or auxiliary-power requirement.

■■■■■■ ■ ■■■■■■■■■■ ■■■■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■■■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■ ■■■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■■■■ ■■■■ ■■■■ ■■■■■■■■ ■■■■■■■ ■■■■ ■■■■■■■■ ■■■■■■■■■■ ■■■■■■ ■■■ ■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■ ■■ ■■■■■■■■ ■■■■■■■■■■ ■ ■■■■■■■■ ■■■■■■■■■■ ■■■ ■■ ■■■■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■ ■■■■■■■■ ■■■■■■■■ ■ ■■■■■■■■■■ These historical examples establish different material destinations, not current sourcing commitments. Suppliers should establish the current component program and attributable material release before dedicating supply; aggregate engine activity, a demonstrator, or historical vehicle use cannot settle that decision.

Figure 12. Global Nickel-Based Superalloys for Aerospace Market Size, by Component Application, 2025 (%)

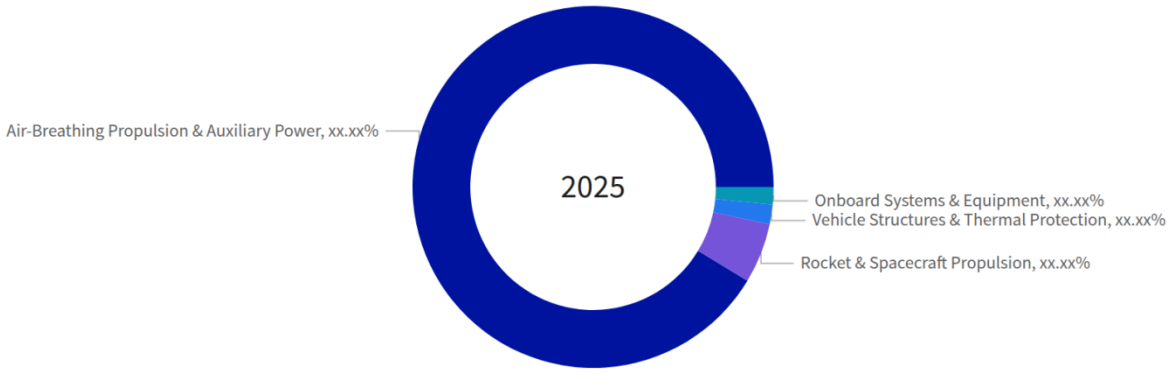

Figure 13. Global Nickel-Based Superalloys for Aerospace Market, by Component Application, 2032 (USD Million)

Table 38. Global Nickel-Based Superalloys for Aerospace Market, by Component Application growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Air-Breathing Propulsion & Auxiliary Power	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Systems & Equipment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rocket & Spacecraft Propulsion	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Vehicle Structures & Thermal Protection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 39. Global Nickel-Based Superalloys for Aerospace Market Size, by Component Application, 2017-2040 (USD Million)

Component Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Breathing Propulsion & Auxiliary Power	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Systems & Equipment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rocket & Spacecraft Propulsion	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Vehicle Structures & Thermal Protection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. DPC Holdings Limited - Draft Registration Statement, April 14, 2026

   · The disclosure distinguishes predominantly new-build aerospace structural castings, typically retained for an engine's life, from planned aerospace airfoil activity with replacement exposure. It does not establish the same lifecycle pattern across the market.
   ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))

2. Haynes International - HAYNES 230

   · The producer's application description connects Haynes xx.xx with combustion cans and related gas-turbine hardware; it does not establish coverage of every engine component.
   ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))

3. NASA - Chapter 2: Aerospace Materials Characteristics

   · NASA's application account distinguishes nickel-superalloy uses in compressor components, turbine disks and blades, combustion and exhaust areas, and rocket-engine hardware. These are application classifications, not supplier awards. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

   · Taxonomy evidence: The aerospace-applications section identifies aircraft turbine engines and rocket engines as distinct superalloy-consuming systems; it does not establish a global allocation.
   ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed.
   ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

4. SIEF RP04-153 - Aero-engine Final Report Summary 2017

   · The 2017 project summary identifies a Safran auxiliary-power demonstrator and Hastelloy X among its materials. This supports developmental application evidence rather than recurring production procurement.
   ([sief.org.au](https://sief.org.au/wp-content/uploads/2019/xx.xx/RP04-153AeroFinalReportSummary.pdf))

5. NASA and Superalloys: A Customer, a Participant, and a Referee

   · NASA's 2008 account identifies IN718 in Shuttle wing backing structures and International Space Station battery pressure vessels, establishing historical structural and onboard-equipment uses without establishing current sourcing.
   ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award.
   ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award.
   ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program.
   ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program.
   ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))

6. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
7. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
8. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
9. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
10. Howmet Aerospace Inc. - 2025 Form 10-K
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
11. GE Aerospace - 2025 Sustainability Report
    - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
    - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
    - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.

12. ESA - ESA Space Environment Report 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
13. VDM Metals - Alloys for the Aerospace Industry
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))

9.1. Air-Breathing Propulsion & Auxiliary Power

Table 40. Global Nickel-Based Superalloys for Aerospace Market, by Air-Breathing Propulsion & Auxiliary Power growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Combustion & Exhaust Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Compressor Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine Structures & Auxiliary Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Blades & Vanes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Disks & Rotor Hardware	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 41. Global Nickel-Based Superalloys for Aerospace Market Size, by Air-Breathing Propulsion & Auxiliary Power, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 42. Global Nickel-Based Superalloys for Aerospace Market Size, by Air-Breathing Propulsion & Auxiliary Power, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 43. Global Nickel-Based Superalloys for Aerospace Market Size, by Air-Breathing Propulsion & Auxiliary Power, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Chapter 2: Aerospace Materials Characteristics

   · Taxonomy evidence: The chapter describes nickel-superalloy use across compressor, combustion and turbine sections of aircraft engines. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

2. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
3. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
4. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.

5. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
6. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))

7. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: GE describes repaired/serviceable-part reuse, supporting a counterforce to converting aftermarket activity directly into newly supplied material purchases. Its reported approximately xx.xx% strategic-nickel revert content is not deducted from the terminal-material market. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Commercial repair and component reuse support retaining uncertainty around replacement-related combustion material purchases. The selected procurement-intensity offset remains an assumption, not a measured avoided-purchase percentage. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
8. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
13. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
14. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
15. DPC Holdings Limited - Registration Statement with 2025 Financial Statements
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))

16. Haynes International - HAYNES 230
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
17. Precision Castparts Corp. - Fiscal 2015 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
18. Carpenter Technology - Business Segments
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))

9.1.1. Turbine Disks & Rotor Hardware

Table 44. Global Nickel-Based Superalloys for Aerospace Market Size, by Turbine Disks & Rotor Hardware, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 45. Global Nickel-Based Superalloys for Aerospace Market Size, by Turbine Disks & Rotor Hardware, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 46. Global Nickel-Based Superalloys for Aerospace Market Size, by Turbine Disks & Rotor Hardware, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Influence of Long Term Exposure in Air on Microstructure, Surface Stability and Mechanical Properties of UDIMET 720LI

   · Taxonomy evidence: The same aerospace-demand-side record identifies turbine disks, corroborating this component category without quantifying its complete rotor-hardware boundary. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

2. Chapter 2: Aerospace Materials Characteristics
   - Taxonomy evidence: The chapter identifies superalloy turbine disks as an aerospace application. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
3. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
4. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
5. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
6. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
7. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.

8. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
9. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
10. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
11. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
12. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

13. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
14. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
15. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
16. Precision Castparts Corp. - Fiscal 2015 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))

9.1.2. Engine Structures & Auxiliary Systems

Table 47. Global Nickel-Based Superalloys for Aerospace Market Size, by Engine Structures & Auxiliary Systems, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 48. Global Nickel-Based Superalloys for Aerospace Market Size, by Engine Structures & Auxiliary Systems, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 49. Global Nickel-Based Superalloys for Aerospace Market Size, by Engine Structures & Auxiliary Systems, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Evaluation of the IN 939 Alloy for Large Aircraft Engine Structures
   · Taxonomy evidence: The paper's stated aircraft-engine structural application supports placement under engine structures rather than treating all turbine-alloy activity as an airfoil application. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2004/Superalloys_2004_441_450.pdf))
2. Development and validation of a powder HIP route for high temperature Astroloy to manufacture Ultrafan® IP Turbine Casings
   · Taxonomy evidence: The 2020-2021 project report identifies nickel-superalloy material for aircraft-engine turbine casings, supporting a structural-engine component category. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting))
3. Transforming the manufacturing of aero-engine casing components for Rolls-Royce and its supply chain
   · Taxonomy evidence: The record identifies superalloy aero-engine casings as commercially consequential components, corroborating their placement within engine structures. ([impact.ref.ac.uk](https://impact.ref.ac.uk/casestudies/CaseStudy.aspx?Id=xx.xx))

4. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
5. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
6. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
7. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
8. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))

9. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
11. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
12. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
13. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

14. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
15. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
16. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
17. DPC Holdings Limited - Registration Statement with 2025 Financial Statements
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))

9.1.3. Turbine Blades & Vanes

Table 50. Global Nickel-Based Superalloys for Aerospace Market Size, by Turbine Blades & Vanes, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 51. Global Nickel-Based Superalloys for Aerospace Market Size, by Turbine Blades & Vanes, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 52. Global Nickel-Based Superalloys for Aerospace Market Size, by Turbine Blades & Vanes, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Chapter 2: Aerospace Materials Characteristics
   · Taxonomy evidence: Nickel-superalloy turbine blades are explicitly identified. This passage does not separately establish every stationary-vane inclusion. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
2. ATI Inc. - 2025 Form 10-K
   · Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
3. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   · Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.

4. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
5. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
6. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
7. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: GE describes repaired/serviceable-part reuse, supporting a counterforce to converting aftermarket activity directly into newly supplied material purchases. Its reported approximately xx.xx% strategic-nickel revert content is not deducted from the terminal-material market. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))

8. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
13. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
14. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
15. DPC Holdings Limited - Registration Statement with 2025 Financial Statements
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
16. Precision Castparts Corp. - Fiscal 2015 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))

9.1.4. Combustion & Exhaust Components

Table 53. Global Nickel-Based Superalloys for Aerospace Market Size, by Combustion & Exhaust Components, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 54. Global Nickel-Based Superalloys for Aerospace Market Size, by Combustion & Exhaust Components, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 55. Global Nickel-Based Superalloys for Aerospace Market Size, by Combustion & Exhaust Components, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Accelerating Manufacturing Readiness level of ABD®-1000AM for AM of high temperature aerospace components (AMRAM1000)

   · Taxonomy evidence: The project identifies a combustor-tile demonstrator, supporting combustion-component placement for this developmental activity rather than establishing production-market demand. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))

2. Chapter 2: Aerospace Materials Characteristics

   · Taxonomy evidence: Combustor materials and the downstream exhaust-nozzle region are distinguished from compressor and turbine components. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

3. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
4. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
5. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
6. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
7. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.

8. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Commercial repair and component reuse support retaining uncertainty around replacement-related combustion material purchases. The selected procurement-intensity offset remains an assumption, not a measured avoided-purchase percentage. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
9. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
10. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
11. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
12. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

13. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
14. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
15. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
16. Haynes International - HAYNES 230
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))

9.1.5. Compressor Components

Table 56. Global Nickel-Based Superalloys for Aerospace Market Size, by Compressor Components, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 57. Global Nickel-Based Superalloys for Aerospace Market Size, by Compressor Components, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 58. Global Nickel-Based Superalloys for Aerospace Market Size, by Compressor Components, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Influence of Long Term Exposure in Air on Microstructure, Surface Stability and Mechanical Properties of UDIMET 720LI

   · Taxonomy evidence: The introduction identifies aerospace compressor disks as an application of the explicitly named 720LI material. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

2. Chapter 2: Aerospace Materials Characteristics

   · Taxonomy evidence: IN-xx.xx compressor disks and blades, and stronger nickel-base alloys for later compressor stages, are described. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

3. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
4. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
5. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
6. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
7. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
8. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.

9. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
10. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
11. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
12. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

13. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
14. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
15. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
16. Carpenter Technology - Business Segments
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))

9.2. Rocket & Spacecraft Propulsion

Table 59. Global Nickel-Based Superalloys for Aerospace Market Size, by Rocket & Spacecraft Propulsion, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 60. Global Nickel-Based Superalloys for Aerospace Market Size, by Rocket & Spacecraft Propulsion, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 61. Global Nickel-Based Superalloys for Aerospace Market Size, by Rocket & Spacecraft Propulsion, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Chapter 2: Aerospace Materials Characteristics

   · Taxonomy evidence: Rocket-engine turbopump blades, disks and housings are identified as superalloy applications, including IN-xx.xx. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

2. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
3. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
4. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
5. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
6. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
7. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.

8. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
13. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
14. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
15. ESA - ESA Space Environment Report 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))

9.3. Vehicle Structures & Thermal Protection

Table 62. Global Nickel-Based Superalloys for Aerospace Market Size, by Vehicle Structures & Thermal Protection, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 63. Global Nickel-Based Superalloys for Aerospace Market Size, by Vehicle Structures & Thermal Protection, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 64. Global Nickel-Based Superalloys for Aerospace Market Size, by Vehicle Structures & Thermal Protection, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. NASA and Superalloys: A Customer, a Participant, and a Referee

   · Taxonomy evidence: The 2008 paper records IN718 in Space Shuttle wing backing and thermal-protection supporting structures, establishing a historical non-engine structural application. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))

2. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
3. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
4. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
5. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
6. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
7. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.

8. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
13. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
14. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
15. VDM Metals - Alloys for the Aerospace Industry
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))

9.4. Onboard Systems & Equipment

Table 65. Global Nickel-Based Superalloys for Aerospace Market Size, by Onboard Systems & Equipment, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 66. Global Nickel-Based Superalloys for Aerospace Market Size, by Onboard Systems & Equipment, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 67. Global Nickel-Based Superalloys for Aerospace Market Size, by Onboard Systems & Equipment, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. NASA and Superalloys: A Customer, a Participant, and a Referee

   · Taxonomy evidence: Historical examples include IN718 in Shuttle rudder-speed-brake hardware and International Space Station battery pressure vessels, supporting non-propulsion equipment uses. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))

2. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
3. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
4. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
5. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
6. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
7. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.

8. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
13. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
14. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.

10. Nickel-Based Superalloys for Aerospace Market, by Demand Stage

Initial Equipment Production and Replacement & Retrofit Production can purchase against the same authorized improvement while serving different destinations. ■■■■■■■■■■■■■ ■■■■■ ■■■■■■■■ ■■■■■■■■ ■ ■■■■■ ■■■■ ■■ ■■■■■ ■■■■■■■■■■■ ■■■■■■■■■ ■■ ■■■■ ■■■■ ■■■ ■■■■■■■ ■■ ■■■ ■■■ ■■■■■■■■■■■ ■■■■■■■■ ■■■ ■■■■■■■■ ■■■■■ ■■■■■■■■■ ■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■■■■■■ ■■■■■■■■ ■■■ ■■■■■■■ ■■■■■■■■■■■■■ ■■■■ ■ ■■■ ■■■■ ■■ ■■■■■ ■■■■■■■■■■■■■■ Production planning should distinguish first installation from replacement or retrofit releases even when the grade and form coincide.

■■■■■■■■ ■■■■■■■■ ■ ■■■■■■■■■■■■■■ ■■■■■■■■■■ ■ ■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■ ■■ ■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■ ■■■ ■■■■■ ■■■■■■■■■■■■ ■■■■■ ■■ ■■■■■■■■■■■■■ ■■ ■■■ ■■■■■■■■■■■■■■ ■ ■■■■■■■■■■■■ ■■■■■ ■■■ ■■■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■ ■■ ■■■■■■■■■■ ■■■■■■■■■■■■ ■■■ ■■■■■ ■■■■■■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■■■■■ Sellers should identify the authorized workscope and material obligation before reserving supply. Treating all maintenance activity as replacement production would expose commitments to repair, reuse, and workscope changes.

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Figure 14. Global Nickel-Based Superalloys for Aerospace Market Size, by Demand Stage, 2025 (%)

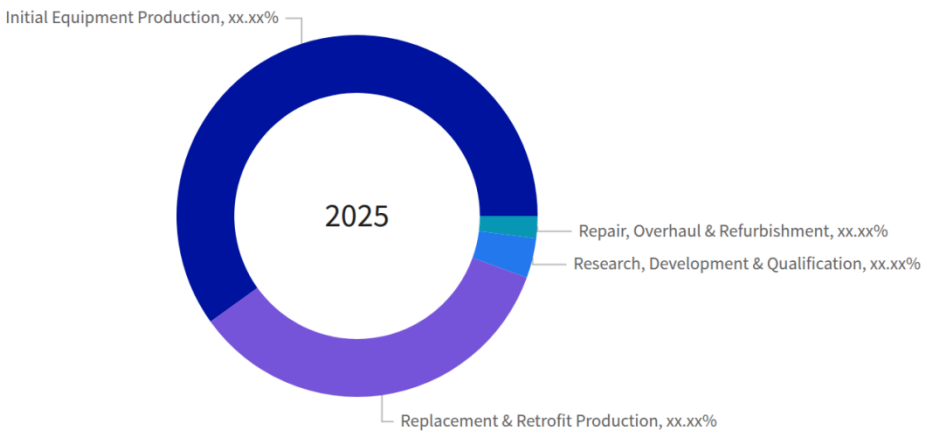

Figure 15. Global Nickel-Based Superalloys for Aerospace Market, by Demand Stage, 2032 (USD Million)

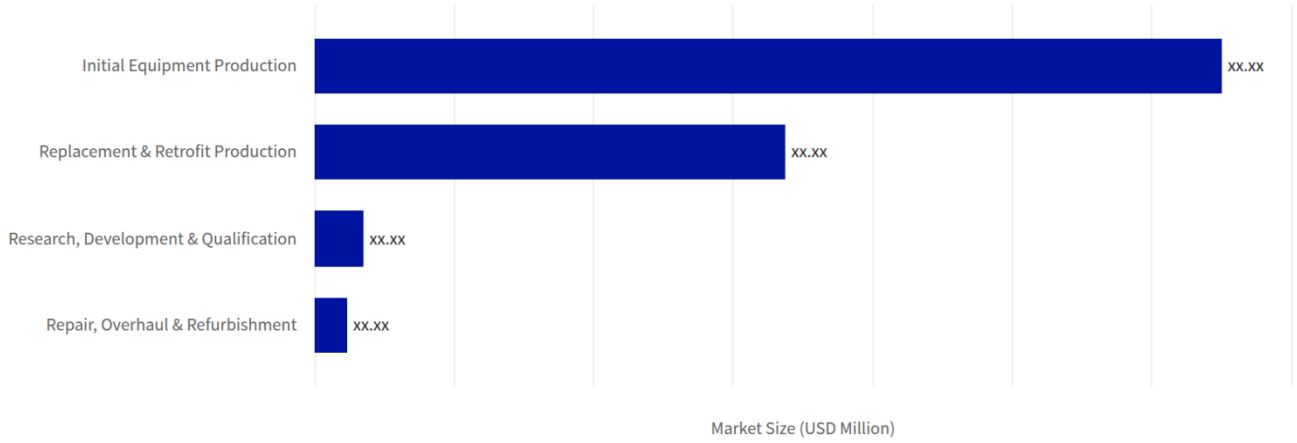

Table 68. Global Nickel-Based Superalloys for Aerospace Market, by Demand Stage growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Initial Equipment Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Repair, Overhaul & Refurbishment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Replacement & Retrofit Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research, Development & Qualification	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 69. Global Nickel-Based Superalloys for Aerospace Market Size, by Demand Stage, 2017-2040 (USD Million)

Demand Stage	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Initial Equipment Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Repair, Overhaul & Refurbishment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Replacement & Retrofit Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research, Development & Qualification	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Rolls-Royce Holdings Plc - 2025 Full Year Results

· Rolls-Royce's 2025 results report certification of the Trent xx.xx XE phase-one blade improvement in June 2025 and its fitting to new and in-service engines. This supports distinguishing initial installation from retrofit destinations.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2028 shop-visit target is below the reported 2025 total despite prospective fleet growth, qualifying any automatic conversion of fleet expansion into proportionate maintenance-material purchasing.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

2. GE Aerospace - 2025 Sustainability Report
   - GE Aerospace describes component restoration and serviceable-part reuse as alternatives to newly manufactured replacement parts. The material consequence therefore depends on the selected maintenance workscope. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
3. UKRI - Accelerating Manufacturing Readiness Level of ABD-1000AM for High Temperature Aerospace Components
   - UKRI identifies Alloyed as lead participant in the ABD-1000AM aerospace development project and gives an April 2025-October 2026 funded period. The record concerns development rather than a standing production purchase. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The Alloyed-led project has xx.xx of funding and an April 2025-October 2026 funded period. This independently establishes bounded development activity, not annual material sales or recurring production purchases. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
4. 2022 Economic Census - Aerospace Product and Parts Manufacturing Questionnaire (MC-33641)
   - Taxonomy evidence: The questionnaire defines rebuilt/remanufactured products by restoration of a used or worn article and separately distinguishes repair services. This supports lifecycle classification by the existing article being restored, not merely the presence of newly manufactured parts. ([bhs.econ.census.gov](https://bhs.econ.census.gov/ombpdfs2022/export/2022_MC-33641_su.pdf))
   - Taxonomy evidence: The questionnaire separately identifies new products, rebuilt/remanufactured products, services and engine prototypes, supporting lifecycle distinctions without resolving material-order destinations. ([bhs.econ.census.gov](https://bhs.econ.census.gov/ombpdfs2022/export/2022_MC-33641_su.pdf))
5. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.

6. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
7. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
8. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
9. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported 2025 sales of USD xx.xx and Engine Products aerospace revenues of USD xx.xx commercial and USD xx.xx defense establish the component-cohort scale; USD xx.xx gas-turbine revenue is excluded through an explicit attribution model. These are not material-market revenues. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The segment/end-market revenue table supplies the aerospace and gas-turbine boundaries needed to bridge combined spares activity into an aerospace replacement-material proxy. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
10. Howmet Aerospace - 2025 Annual Report, Letter to Shareholders
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% combined aerospace and gas-turbine spares revenue constrains the distinction between initial-production and spare-component activity; material and destination adjustments remain modeled. ([howmet.com](https://www.howmet.com/annualreport/))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed combined spares proportion supplies the replacement proxy; approximately xx.xx% commercial aerospace engine-spares growth is historical counterevidence against assuming weak aftermarket activity. ([howmet.com](https://www.howmet.com/annualreport/))

11. GE Aerospace - 2025 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment and services costs provide commercial budget anchors for the common material-value denominator; assumed eligible-material fractions prevent full equipment or service value from entering the allocation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Services include spare parts and maintenance activity, supporting an explicit new-article versus restoration attribution rather than equating services revenue with replacement-material purchases. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported USD xx.xx services cost anchors the restoration-material bridge; the restoration allocation and direct eligible-material fraction are assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Total funded R&D of USD xx.xx supplies a development-budget proxy, not observed nickel-material purchasing; only an assumed eligible-material fraction is used. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
12. Safran - FY 2025 Results and Investor Update, February 13, 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
13. Airbus - Full-Year 2025 Results
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 deliveries by aircraft family provide the starting activity comparison for the initial-production forecast; aircraft delivery value is not included in the material numerator. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx% decline in 2025 self-financed R&D is counterevidence to uniform development-budget acceleration and supports a restrained, explicitly assumed development-purchasing scenario. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))

14. Airbus - Half-Year 2026 Results
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 update retained the A320-family, A350 and other production-rate targets, providing a dated commercial constraint on the initial-production activity scenario rather than proof of future material orders. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: First-half 2026 self-financed R&D of EUR xx.xx versus EUR xx.xx provides a modest-growth countercheck for the assumed development-project activity path; the budget is not material-market revenue. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))

10.1. Initial Equipment Production

Table 70. Global Nickel-Based Superalloys for Aerospace Market Size, by Initial Equipment Production, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 71. Global Nickel-Based Superalloys for Aerospace Market Size, by Initial Equipment Production, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 72. Global Nickel-Based Superalloys for Aerospace Market Size, by Initial Equipment Production, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. 2022 Economic Census - Aerospace Product and Parts Manufacturing Questionnaire (MC-33641)
   · Taxonomy evidence: New aircraft engines and new engine parts are explicit product classes. Newly manufactured parts are not necessarily destined for initial installation. ([bhs.econ.census.gov](https://bhs.econ.census.gov/ombpdfs2022/export/2022_MC-33641_su.pdf))
2. ATI Inc. - 2025 Form 10-K
   · Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
3. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   · Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.

4. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
5. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
6. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported 2025 sales of USD xx.xx and Engine Products aerospace revenues of USD xx.xx commercial and USD xx.xx defense establish the component-cohort scale; USD xx.xx gas-turbine revenue is excluded through an explicit attribution model. These are not material-market revenues. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
7. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
8. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.

9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.
12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
13. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
14. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
15. Howmet Aerospace - 2025 Annual Report, Letter to Shareholders
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% combined aerospace and gas-turbine spares revenue constrains the distinction between initial-production and spare-component activity; material and destination adjustments remain modeled. ([howmet.com](https://www.howmet.com/annualreport/))

16. GE Aerospace - 2025 Form 10-K

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment and services costs provide commercial budget anchors for the common material-value denominator; assumed eligible-material fractions prevent full equipment or service value from entering the allocation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

17. Rolls-Royce Holdings Plc - 2025 Full Year Results

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders. ([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders. ([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

18. Safran - FY 2025 Results and Investor Update, February 13, 2026

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))

19. Airbus - Full-Year 2025 Results

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 deliveries by aircraft family provide the starting activity comparison for the initial-production forecast; aircraft delivery value is not included in the material numerator. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))

20. Airbus - Half-Year 2026 Results

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 update retained the A320-family, A350 and other production-rate targets, providing a dated commercial constraint on the initial-production activity scenario rather than proof of future material orders. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))

10.2. Replacement & Retrofit Production

Table 73. Global Nickel-Based Superalloys for Aerospace Market Size, by Replacement & Retrofit Production, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 74. Global Nickel-Based Superalloys for Aerospace Market Size, by Replacement & Retrofit Production, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 75. Global Nickel-Based Superalloys for Aerospace Market Size, by Replacement & Retrofit Production, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Parts Manufacturer Approval (PMA) - Design Approval

   · Taxonomy evidence: The FAA recognizes replacement and modification articles as distinct commercial approval subjects. This supports aftermarket-purpose classification, not an approval requirement for base alloy material. ([faa.gov](https://www.faa.gov/aircraft/air_cert/design_approvals/pma/pma_des))

2. ATI Inc. - 2025 Form 10-K

   · Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.

3. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K

   · Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.

4. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
5. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
6. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The segment/end-market revenue table supplies the aerospace and gas-turbine boundaries needed to bridge combined spares activity into an aerospace replacement-material proxy. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
7. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))

8. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
13. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
14. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
15. Howmet Aerospace - 2025 Annual Report, Letter to Shareholders
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed combined spares proportion supplies the replacement proxy; approximately xx.xx% commercial aerospace engine-spares growth is historical counterevidence against assuming weak aftermarket activity. ([howmet.com](https://www.howmet.com/annualreport/))
16. GE Aerospace - 2025 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Services include spare parts and maintenance activity, supporting an explicit new-article versus restoration attribution rather than equating services revenue with replacement-material purchases. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
17. Rolls-Royce Holdings Plc - 2025 Full Year Results
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share. ([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share. ([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

18. Safran - FY 2025 Results and Investor Update, February 13, 2026

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))

10.3. Research, Development & Qualification

Table 76. Global Nickel-Based Superalloys for Aerospace Market Size, by Research, Development & Qualification, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 77. Global Nickel-Based Superalloys for Aerospace Market Size, by Research, Development & Qualification, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 78. Global Nickel-Based Superalloys for Aerospace Market Size, by Research, Development & Qualification, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Accelerating Manufacturing Readiness level of ABD®-1000AM for AM of high temperature aerospace components (AMRAM1000)
   · Taxonomy evidence: The funded project concerns aerospace demonstrator and readiness advancement, providing a development-demand example without disclosing underlying material-purchase quantities. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The Alloyed-led project has xx.xx of funding and an April 2025-October 2026 funded period. This independently establishes bounded development activity, not annual material sales or recurring production purchases. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
2. NASA and Superalloys: A Customer, a Participant, and a Referee
   · Taxonomy evidence: NASA describes superalloy research and development involving government, industry and universities, separately from operational vehicle applications. ([ntrs.nasa.gov](https://ntrs.nasa.gov/citations/xx.xx))
3. Development and validation of a powder HIP route for high temperature Astroloy to manufacture Ultrafan® IP Turbine Casings
   · Taxonomy evidence: The funded project concerns development and demonstration of aerospace superalloy casing hardware, establishing developmental rather than recurring production activity. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting))

4. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
5. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
6. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
7. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
8. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
9. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.

10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
11. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
12. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
13. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

14. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
15. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
16. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
17. GE Aerospace - 2025 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Total funded R&D of USD xx.xx supplies a development-budget proxy, not observed nickel-material purchasing; only an assumed eligible-material fraction is used. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
18. Airbus - Full-Year 2025 Results
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx% decline in 2025 self-financed R&D is counterevidence to uniform development-budget acceleration and supports a restrained, explicitly assumed development-purchasing scenario. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
19. Airbus - Half-Year 2026 Results
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: First-half 2026 self-financed R&D of EUR xx.xx versus EUR xx.xx provides a modest-growth countercheck for the assumed development-project activity path; the budget is not material-market revenue. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))

10.4. Repair, Overhaul & Refurbishment

Table 79. Global Nickel-Based Superalloys for Aerospace Market Size, by Repair, Overhaul & Refurbishment, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 80. Global Nickel-Based Superalloys for Aerospace Market Size, by Repair, Overhaul & Refurbishment, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 81. Global Nickel-Based Superalloys for Aerospace Market Size, by Repair, Overhaul & Refurbishment, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. 2022 Economic Census - Aerospace Product and Parts Manufacturing Questionnaire (MC-33641)

   · Taxonomy evidence: The definition allows reused, repaired, and new parts within a rebuilt article, supporting the rule that new material consumption does not automatically constitute initial-equipment or standalone replacement production. ([bhs.econ.census.gov](https://bhs.econ.census.gov/ombpdfs2022/export/2022_MC-33641_su.pdf))

   · Taxonomy evidence: Rebuilt/remanufactured products are distinguished from new products and repair services, supporting a restoration-purpose category. ([bhs.econ.census.gov](https://bhs.econ.census.gov/ombpdfs2022/export/2022_MC-33641_su.pdf))

2. 76th PMXG Welding Shops are forging strong bonds

   · Taxonomy evidence: The September xx.xx 2015 depot account describes aircraft-engine component repair and lists Inconel among handled materials. It does not identify every consumed grade or product form. ([tinker.af.mil](https://www.tinker.af.mil/News/Article-Display/Article/xx.xx/76th-pmxg-welding-shops-are-forging-strong-bonds/))

3. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
4. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
5. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
6. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
7. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
8. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))

9. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
10. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
11. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
12. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

13. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
14. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
15. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
16. GE Aerospace - 2025 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported USD xx.xx services cost anchors the restoration-material bridge; the restoration allocation and direct eligible-material fraction are assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
17. Rolls-Royce Holdings Plc - 2025 Full Year Results
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2028 shop-visit target is below the reported 2025 total despite prospective fleet growth, qualifying any automatic conversion of fleet expansion into proportionate maintenance-material purchasing. ([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

11. Nickel-Based Superalloys for Aerospace Market, by Aerospace End Market

[redacted] Within U.S. civil production, xx.xx CFR xx.xx places supplier-control obligations on the production approval holder. Material sellers must identify the actual approving organization and governing contract rather than infer access from the operator's commercial or government label.

[redacted] Aubert & Duval's 2024 defense brochure identifies AD730 and an Alloy xx.xx offering for missile customers, establishing a public material-commercial connection without demonstrating participation in an individual program. A defense seller should resolve the governing clause and acceptable origin documentation before committing to the order.

Space Systems is not synonymous with military procurement. Aubert & Duval's space portfolio includes nickel-superalloy offerings within a broader space-business proposition. [redacted]

Figure 16. Global Nickel-Based Superalloys for Aerospace Market Size, by Aerospace End Market, 2025 (%)

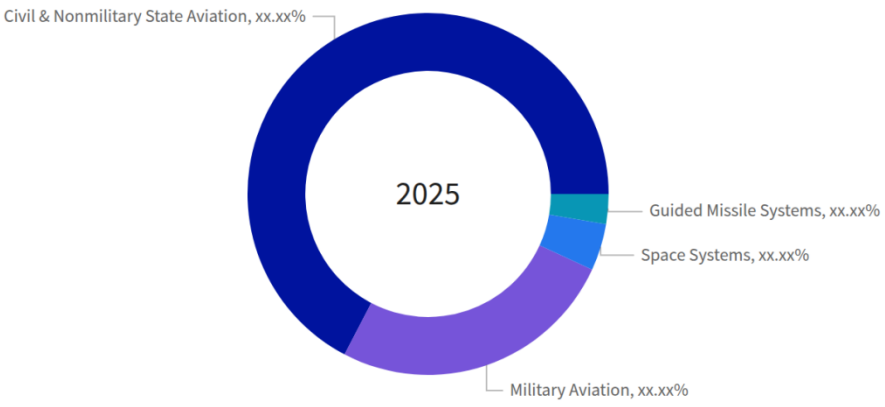

Figure 17. Global Nickel-Based Superalloys for Aerospace Market, by Aerospace End Market, 2032 (USD Million)

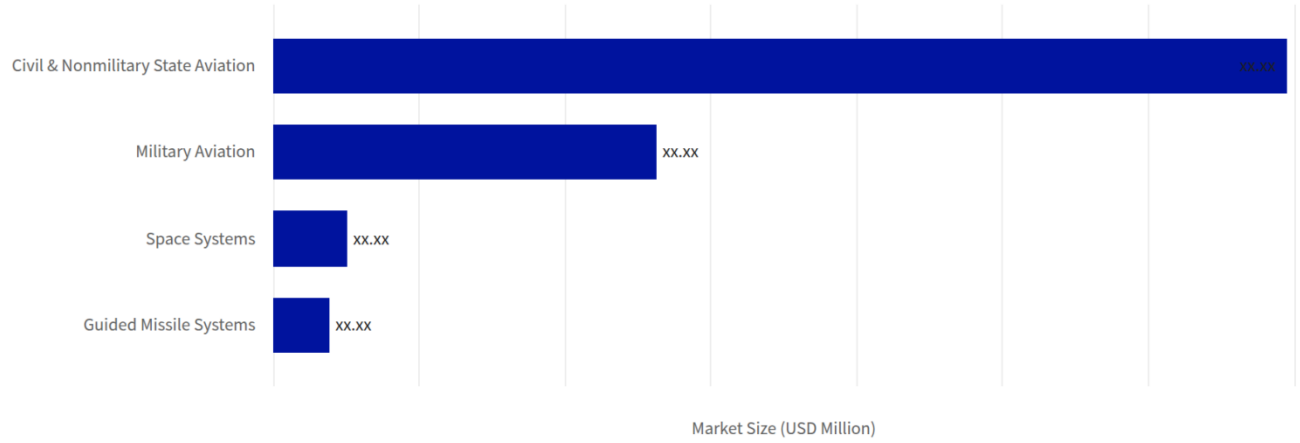

Table 82. Global Nickel-Based Superalloys for Aerospace Market, by Aerospace End Market growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Civil & Nonmilitary State Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Guided Missile Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Military Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Space Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 83. Global Nickel-Based Superalloys for Aerospace Market Size, by Aerospace End Market, 2017-2040 (USD Million)

Aerospace End Market	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Civil & Nonmilitary State Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Guided Missile Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Military Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Space Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. DFARS 252.225-7009 - Restriction on Acquisition of Certain Articles Containing Specialty Metals

   · DFARS xx.xx-xx.xx recognizes U.S., outlying-area, and qualifying-country origins, with specified exceptions. The clause concerns upstream specialty-metal origin rather than warehouse location alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))

2. Electronic Code of Federal Regulations - 14 CFR 21.137, Quality System

   · xx.xx CFR xx.xx requires supplier controls addressing conformity to the production approval holder's requirements within the applicable U.S. production-certificate framework. ([ecfr.gov](https://www.ecfr.gov/current/title-xx.xx/chapter-I/subchapter-C/part-xx.xx/subpart-G/section-xx.xx))

3. ICAO - Convention on International Civil Aviation, Ninth Edition

   · Article xx.xx distinguishes civil and state aircraft and identifies aircraft used in military, customs, and police services as state aircraft. The combined commercial segment therefore does not imply uniform civil legal status. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))

4. DFARS 225.7003-2 - Restrictions

   · DFARS xx.xx-xx.xx expressly addresses covered aircraft and missile or space systems and separately addresses specialty metal acquired as an end item, subject to applicable exceptions. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restrictions.))

5. Aubert & Duval - Metallurgical Solutions for the Defense Industry, June 2024
   - The brochure's missile-business section identifies AD730 and PYRAD53NW, labeled INCO718, as nickel-based offerings. This establishes the supplier's commercial-category connection, not an individual program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
6. Aubert & Duval - Space Industry Metallurgical Solutions
   - Aubert & Duval's space brochure identifies nickel-superalloy offerings within a portfolio spanning several space-business settings. It does not establish that each grade serves every named program or has uniform procurement eligibility. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
7. 2022 Economic Census - Aerospace Product and Parts Manufacturing Questionnaire (MC-33641)
   - Taxonomy evidence: Civilian and military aircraft engines and parts are separately identified, supporting the aviation-sector distinction rather than material volumes. ([bhs.econ.census.gov](https://bhs.econ.census.gov/ombpdfs2022/export/2022_MC-33641_su.pdf))
8. NATO Policy for civil/military aircraft operating in support of NATO or NATO-led missions and operations
   - Taxonomy evidence: The ICAO-hosted NATO presentation distinguishes civil aircraft from state aircraft and identifies military, customs and police services within the state-aircraft concept. ([icao.int](https://www.icao.int/sites/default/files/EURNAT/MeetingDocs/ICAO%20EUR%20Region%20Civil-Military%20Cooperation%20Meetings/2015%20ICAO%20Civil-Military%20Cooperation%20Symposium/ICMCS-PPT10.pdf))

9. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial jet-engine revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025, supporting purchasing recovery but not identifying price growth or a 2032 material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Commercial jet-engine revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025, supporting purchasing recovery but not identifying price growth or a 2032 material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separately reports defense end-market receipts, supporting a commercial distinction while requiring nickel eligibility and aviation-destination adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separately reports defense end-market receipts, supporting a commercial distinction while requiring nickel eligibility and aviation-destination adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
10. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
11. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
12. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
13. Howmet Aerospace Inc. - 2025 Form 10-K
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial aerospace represented xx.xx% of 2025 company sales, supplying an independent downstream mix comparison rather than a nickel-material allocation weight. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense aerospace represented xx.xx% of 2025 company sales; the paired commercial/defense comparison tests the aviation model while retaining component and material-scope differences. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))

14. GE Aerospace - 2025 Sustainability Report
    - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
    - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
    - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
15. GE Aerospace - 2025 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
16. Rolls-Royce Holdings Plc - 2025 Full Year Results
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment. ([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment. ([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand. ([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand. ([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

17. RTX Corporation - 2025 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
18. Federal Reserve Bank of St. Louis - Annual USD/GBP Exchange Rate, AEXUSUK
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
19. L3Harris Technologies, Inc. - Fiscal 2025 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
20. FAA Aerospace Forecast Fiscal Years 2025-2045 - Commercial Space
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated official low/high scenarios provide FY2032 licensed launch/reentry activity bounds. Their U.S.-licensed scope and treatment of reusable vehicles prevent direct conversion into Global material revenue. ([faa.gov](https://www.faa.gov/data_research/aviation/aerospace_forecasts/2025-commercial-space.pdf))

11.1. Civil & Nonmilitary State Aviation

Table 84. Global Nickel-Based Superalloys for Aerospace Market Size, by Civil & Nonmilitary State Aviation, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 85. Global Nickel-Based Superalloys for Aerospace Market Size, by Civil & Nonmilitary State Aviation, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 86. Global Nickel-Based Superalloys for Aerospace Market Size, by Civil & Nonmilitary State Aviation, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. NATO Policy for civil/military aircraft operating in support of NATO or NATO-led missions and operations

   · Taxonomy evidence: Customs and police aircraft demonstrate why a commercial aviation partition needs an explicit treatment for nonmilitary state aviation; their material demand is not quantified. ([icao.int](https://www.icao.int/sites/default/files/EURNAT/MeetingDocs/ICAO%20EUR%20Region%20Civil-Military%20Cooperation%20Meetings/2015%20ICAO%20Civil-Military%20Cooperation%20Symposium/ICMCS-PPT10.pdf))

2. Annex 6 - Operation of Aircraft

   · Taxonomy evidence: ICAO's Annex xx.xx account separately recognizes international commercial air transport and general aviation, supporting inclusion of both within the civil-aviation domain without equating civil aviation with airlines alone. ([icao.int](https://www.icao.int/sites/default/files/postalhistory/annex_6_operation_of_aircraft.htm))

3. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial jet-engine revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025, supporting purchasing recovery but not identifying price growth or a 2032 material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Commercial jet-engine revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025, supporting purchasing recovery but not identifying price growth or a 2032 material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
4. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
5. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
6. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
7. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial aerospace represented xx.xx% of 2025 company sales, supplying an independent downstream mix comparison rather than a nickel-material allocation weight. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))

8. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
9. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
10. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
11. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
12. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

13. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
14. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
15. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
16. GE Aerospace - 2025 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
17. Rolls-Royce Holdings Plc - 2025 Full Year Results
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment. ([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment. ([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

18. RTX Corporation - 2025 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
19. Federal Reserve Bank of St. Louis - Annual USD/GBP Exchange Rate, AEXUSUK
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
20. ICAO - Convention on International Civil Aviation, Ninth Edition
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))

11.2. Military Aviation

Table 87. Global Nickel-Based Superalloys for Aerospace Market Size, by Military Aviation, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 88. Global Nickel-Based Superalloys for Aerospace Market Size, by Military Aviation, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 89. Global Nickel-Based Superalloys for Aerospace Market Size, by Military Aviation, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. 2022 Economic Census - Aerospace Product and Parts Manufacturing Questionnaire (MC-33641)
   - Taxonomy evidence: Military aircraft engines and associated parts have explicit reporting categories. ([bhs.econ.census.gov](https://bhs.econ.census.gov/ombpdfs2022/export/2022_MC-33641_su.pdf))

2. 76th PMXG Welding Shops are forging strong bonds
   - Taxonomy evidence: The account connects Inconel-handling activity with a military aircraft-engine maintenance setting; it is not evidence of current material quantities. ([tinker.af.mil](https://www.tinker.af.mil/News/Article-Display/Article/xx.xx/76th-pmxg-welding-shops-are-forging-strong-bonds/))
3. NATO Policy for civil/military aircraft operating in support of NATO or NATO-led missions and operations
   - Taxonomy evidence: The presentation treats military-registered aircraft as state aircraft, supporting a distinct military-aviation program classification. ([icao.int](https://www.icao.int/sites/default/files/EURNAT/MeetingDocs/ICAO%20EUR%20Region%20Civil-Military%20Cooperation%20Meetings/2015%20ICAO%20Civil-Military%20Cooperation%20Symposium/ICMCS-PPT10.pdf))
4. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separately reports defense end-market receipts, supporting a commercial distinction while requiring nickel eligibility and aviation-destination adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separately reports defense end-market receipts, supporting a commercial distinction while requiring nickel eligibility and aviation-destination adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
5. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
6. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
7. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.

8. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense aerospace represented xx.xx% of 2025 company sales; the paired commercial/defense comparison tests the aviation model while retaining component and material-scope differences. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
9. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
11. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
12. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
13. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

14. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
15. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
16. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
17. GE Aerospace - 2025 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
18. Rolls-Royce Holdings Plc - 2025 Full Year Results
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand. ([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand. ([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

19. RTX Corporation - 2025 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
20. Federal Reserve Bank of St. Louis - Annual USD/GBP Exchange Rate, AEXUSUK
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
21. ICAO - Convention on International Civil Aviation, Ninth Edition
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
22. DFARS 252.225-7009 - Restriction on Acquisition of Certain Articles Containing Specialty Metals
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))

11.3. Space Systems

Table 90. Global Nickel-Based Superalloys for Aerospace Market Size, by Space Systems, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 91. Global Nickel-Based Superalloys for Aerospace Market Size, by Space Systems, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 92. Global Nickel-Based Superalloys for Aerospace Market Size, by Space Systems, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. NASA and Superalloys: A Customer, a Participant, and a Referee

   · Taxonomy evidence: Documented Shuttle and space-station applications establish space hardware as a distinct superalloy end-use domain, not a current-demand estimate. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))

2. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
3. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
4. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
5. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
6. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
7. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.

8. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
13. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
14. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
15. L3Harris Technologies, Inc. - Fiscal 2025 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
16. FAA Aerospace Forecast Fiscal Years 2025-2045 - Commercial Space
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated official low/high scenarios provide FY2032 licensed launch/reentry activity bounds. Their U.S.-licensed scope and treatment of reusable vehicles prevent direct conversion into Global material revenue. ([faa.gov](https://www.faa.gov/data_research/aviation/aerospace_forecasts/2025-commercial-space.pdf))
17. Aubert & Duval - Space Industry Metallurgical Solutions
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))

11.4. Guided Missile Systems

Table 93. Global Nickel-Based Superalloys for Aerospace Market Size, by Guided Missile Systems, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 94. Global Nickel-Based Superalloys for Aerospace Market Size, by Guided Missile Systems, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 95. Global Nickel-Based Superalloys for Aerospace Market Size, by Guided Missile Systems, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. North American Industry Classification System, United States, 2022
   · Taxonomy evidence: Guided-missile manufacturing and associated propulsion/parts activities are recognized aerospace categories; the classification does not establish nickel-superalloy content. ([census.gov](https://www.census.gov/naics/reference_files_tools/2022_NAICS_Manual.pdf))
2. ATI Inc. - 2025 Form 10-K
   · Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
3. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   · Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.

4. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
5. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
6. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
7. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
8. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.

9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.
12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
13. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
14. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.

15. L3Harris Technologies, Inc. - Fiscal 2025 Form 10-K

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))

16. DFARS 252.225-7009 - Restriction on Acquisition of Certain Articles Containing Specialty Metals

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))

17. Aubert & Duval - Metallurgical Solutions for the Defense Industry, June 2024

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))

12. Nickel-Based Superalloys for Aerospace Market, by Buyer Function

[illegible] U.S. civil production approval holders also retain supplier-control obligations. Sellers should map the ordering entity, acceptance authority, and payment responsibility before choosing between an OEM account approach and a component manufacturer's procurement route; either contact alone may leave a commercial gate unresolved.

[illegible] Material supply to the repair organization and permission to market a finished replacement article are therefore different opportunities. Sellers should establish the authorized purchasing purpose rather than assume that an MRO relationship opens a standalone component-sales route.

Research & Development Organizations require a different contracting map. The ABD-1000AM project identifies Alloyed, ITP Aero UK, and Cranfield University in distinct participation roles. [illegible]

Figure 18. Global Nickel-Based Superalloys for Aerospace Market Size, by Buyer Function, 2025 (%)

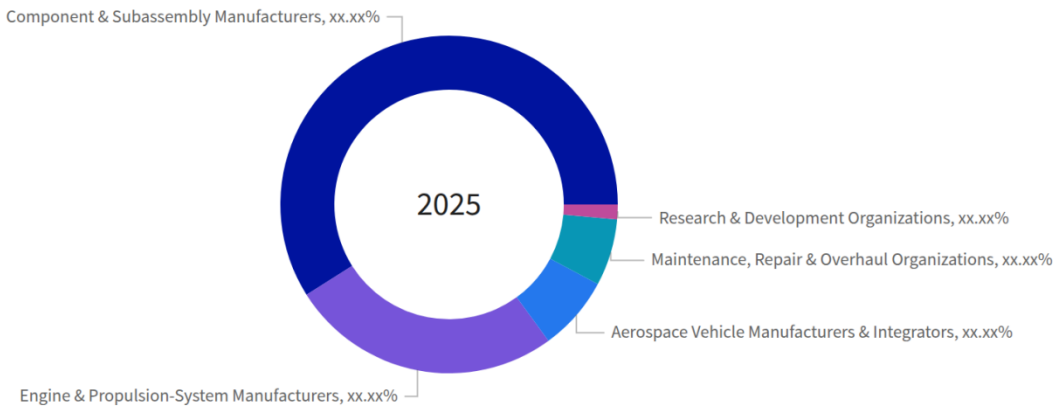

Figure 19. Global Nickel-Based Superalloys for Aerospace Market, by Buyer Function, 2032 (USD Million)

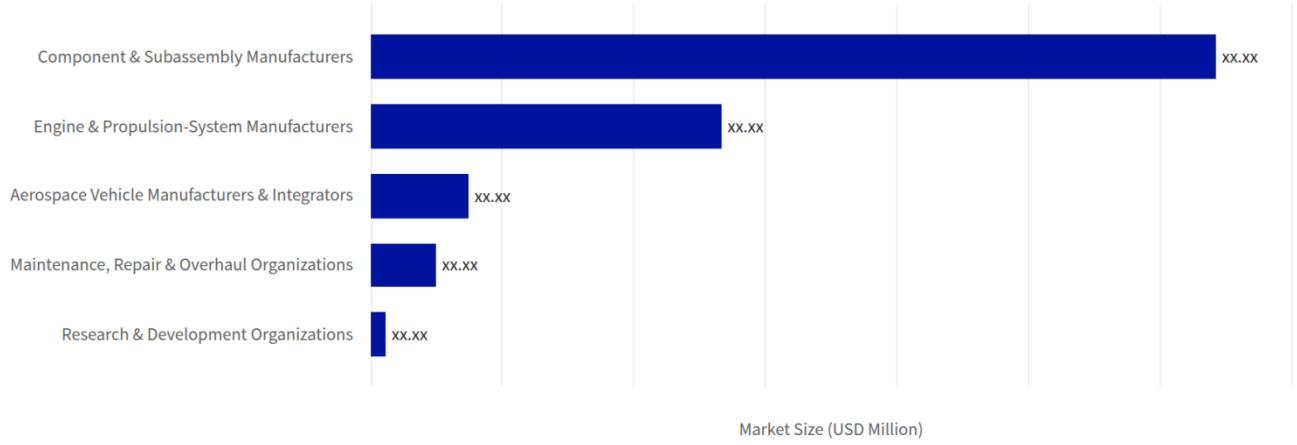

Table 96. Global Nickel-Based Superalloys for Aerospace Market, by Buyer Function growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Aerospace Vehicle Manufacturers & Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Component & Subassembly Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine & Propulsion-System Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Maintenance, Repair & Overhaul Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Development Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 97. Global Nickel-Based Superalloys for Aerospace Market Size, by Buyer Function, 2017-2040 (USD Million)

Buyer Function	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Aerospace Vehicle Manufacturers & Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Component & Subassembly Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine & Propulsion-System Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Maintenance, Repair & Overhaul Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Development Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Boeing Suppliers - Quality

   · Boeing defines supplier-quality applicability through contracts and connects raw-material sourcing controls to contractual requirements. These provisions support distinguishing material procurement from the customer's acceptance authority. ([boeingsuppliers.com](https://www.boeingsuppliers.com/become/quality))

2. GE Aerospace Supplier Portal

   · GE Aerospace distinguishes potential-supplier inquiries and bids from administration of orders, invoices, and payments. These are separate commercial stages rather than equivalent evidence of a purchasing commitment. (supplier.geaerospace.com)

3. Electronic Code of Federal Regulations - 14 CFR 21.137, Quality System

   · Supplier-control obligations reside with the covered production approval holder; this supports distinguishing acceptance oversight from the entity administering a particular material purchase. ([ecfr.gov](https://www.ecfr.gov/current/title-xx.xx/chapter-I/subchapter-C/part-xx.xx/subpart-G/section-xx.xx))

4. UKRI - Accelerating Manufacturing Readiness Level of ABD-1000AM for High Temperature Aerospace Components

   · The record identifies Alloyed, Cranfield University, and ITP Aero UK in project participation roles. It does not allocate the signatory for every material purchase; the contracting distinction is a bounded commercial inference. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.

5. FAA - Parts Manufacturer Approval: Design Approval

   · The FAA's repair-station example concerns an article fabricated for an eligible in-house repair and states that such articles may not be offered separately for sale under that exception. This is not an approval requirement imposed on base alloy material. ([faa.gov](https://www.faa.gov/aircraft/air_cert/design_approvals/pma/pma_des))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.

6. 2022 Economic Census - Aerospace Product and Parts Manufacturing Questionnaire (MC-33641)

   · Taxonomy evidence: The questionnaire's reporting unit is an establishment, providing an official statistical anchor for establishment-level buyer-role attribution rather than classifying an entire corporate group as one consumer type. It does not identify the recipient of every material order. ([bhs.econ.census.gov](https://bhs.econ.census.gov/ombpdfs2022/export/2022_MC-33641_su.pdf))

7. North American Industry Classification System, United States, 2022

   · Taxonomy evidence: The 2022 classification distinguishes aerospace manufacturing, repair and R&D establishments. It supplies a business-role crosswalk, not a ready-made material-buyer partition. ([census.gov](https://www.census.gov/naics/reference_files_tools/2022_NAICS_Manual.pdf))

8. ATI Inc. - 2025 Form 10-K

   · Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.

9. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K

   · Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.

10. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
11. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
12. Howmet Aerospace Inc. - 2025 Form 10-K
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.
13. GE Aerospace - 2025 Sustainability Report
    - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
    - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
    - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.

14. Boeing - BDS Terms and Conditions Guide, D607 Material Substitution Prohibition, November 15, 2013
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
15. Precision Castparts Corp. - Fiscal 2015 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
16. GE Aerospace - 2025 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.
17. Airbus - Full-Year 2025 Results
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.
18. Berkshire Hathaway Inc. - 2025 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.

19. Lufthansa Group Annual Report 2025 - MRO business segment
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
20. Oliver Wyman - Global Fleet And MRO Market Forecast 2026-2036: Key Trends
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
21. German Aerospace Center (DLR) - Financing
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.

12.1. Component & Subassembly Manufacturers

Table 98. Global Nickel-Based Superalloys for Aerospace Market Size, by Component & Subassembly Manufacturers, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 99. Global Nickel-Based Superalloys for Aerospace Market Size, by Component & Subassembly Manufacturers, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 100. Global Nickel-Based Superalloys for Aerospace Market Size, by Component & Subassembly Manufacturers, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. North American Industry Classification System, United States, 2022

   · Taxonomy evidence: Aircraft parts, auxiliary equipment, propulsion parts and vehicle-parts manufacturing are recognized activities, supporting a component-producing business role. ([census.gov](https://www.census.gov/naics/reference_files_tools/2022_NAICS_Manual.pdf))

2. Parts Manufacturer Approval (PMA) - Design Approval
   - Taxonomy evidence: The page distinguishes articles produced for sale from articles produced by owners/operators for their own equipment, supporting separation of producer role from ultimate operator. ([faa.gov](https://www.faa.gov/aircraft/air_cert/design_approvals/pma/pma_des))
3. Transforming the manufacturing of aero-engine casing components for Rolls-Royce and its supply chain
   - Taxonomy evidence: The institutional impact record distinguishes a provider delivering prototype engine casings from the engine-company customer, supporting separate component-supply and propulsion-system roles. ([impact.ref.ac.uk](https://impact.ref.ac.uk/casestudies/CaseStudy.aspx?Id=xx.xx))
4. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
5. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
6. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
7. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
8. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.

9. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
11. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
12. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
13. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

14. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
15. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
16. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
17. Boeing - BDS Terms and Conditions Guide, D607 Material Substitution Prohibition, November 15, 2013
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
18. Precision Castparts Corp. - Fiscal 2015 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
19. Berkshire Hathaway Inc. - 2025 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.

12.2. Engine & Propulsion-System Manufacturers

Table 101. Global Nickel-Based Superalloys for Aerospace Market Size, by Engine & Propulsion-System Manufacturers, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 102. Global Nickel-Based Superalloys for Aerospace Market Size, by Engine & Propulsion-System Manufacturers, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 103. Global Nickel-Based Superalloys for Aerospace Market Size, by Engine & Propulsion-System Manufacturers, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. North American Industry Classification System, United States, 2022
   · Taxonomy evidence: Aircraft-engine manufacturing and guided-missile/space-vehicle propulsion-unit manufacturing are separately identified activities. ([census.gov](https://www.census.gov/naics/reference_files_tools/2022_NAICS_Manual.pdf))
2. Transforming the manufacturing of aero-engine casing components for Rolls-Royce and its supply chain
   · Taxonomy evidence: The engine company is identified as the customer for casing-development work. This establishes a customer role, not direct purchase of every underlying material lot. ([impact.ref.ac.uk](https://impact.ref.ac.uk/casestudies/CaseStudy.aspx?Id=xx.xx))
3. ATI Inc. - 2025 Form 10-K
   · Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.

4. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
5. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
6. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
7. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
8. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
9. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.

10. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
11. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
12. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.
13. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
14. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
15. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
16. Boeing - BDS Terms and Conditions Guide, D607 Material Substitution Prohibition, November 15, 2013
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.

17. GE Aerospace - 2025 Form 10-K
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.

12.3. Aerospace Vehicle Manufacturers & Integrators

Table 104. Global Nickel-Based Superalloys for Aerospace Market Size, by Aerospace Vehicle Manufacturers & Integrators, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 105. Global Nickel-Based Superalloys for Aerospace Market Size, by Aerospace Vehicle Manufacturers & Integrators, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 106. Global Nickel-Based Superalloys for Aerospace Market Size, by Aerospace Vehicle Manufacturers & Integrators, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. North American Industry Classification System, United States, 2022
   - Taxonomy evidence: Complete aircraft, guided-missile and space-vehicle manufacturing are distinguished from supplying parts; satellite manufacturing is separately cross-referenced. ([census.gov](https://www.census.gov/naics/reference_files_tools/2022_NAICS_Manual.pdf))
2. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
3. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.

4. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
5. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
6. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
7. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
8. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.

9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.
12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
13. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
14. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
15. Boeing - BDS Terms and Conditions Guide, D607 Material Substitution Prohibition, November 15, 2013
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.

16. Airbus - Full-Year 2025 Results
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.

12.4. Maintenance, Repair & Overhaul Organizations

Table 107. Global Nickel-Based Superalloys for Aerospace Market Size, by Maintenance, Repair & Overhaul Organizations, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 108. Global Nickel-Based Superalloys for Aerospace Market Size, by Maintenance, Repair & Overhaul Organizations, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 109. Global Nickel-Based Superalloys for Aerospace Market Size, by Maintenance, Repair & Overhaul Organizations, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Parts Manufacturer Approval (PMA) - Design Approval

   · Taxonomy evidence: The FAA explicitly recognizes repair-station fabrication of articles for in-house repair, showing that maintenance organizations can have material-consuming fabrication roles. ([faa.gov](https://www.faa.gov/aircraft/air_cert/design_approvals/pma/pma_des))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.

2. 76th PMXG Welding Shops are forging strong bonds

   · Taxonomy evidence: The Air Force propulsion-maintenance organization documents its own component-restoration activity, providing historical demand-side evidence for the MRO business role. ([tinker.af.mil](https://www.tinker.af.mil/News/Article-Display/Article/xx.xx/76th-pmxg-welding-shops-are-forging-strong-bonds/))

3. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
4. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
5. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
6. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
7. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
8. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.

9. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
10. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
11. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
12. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

13. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
14. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
15. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
16. Lufthansa Group Annual Report 2025 - MRO business segment
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
17. Oliver Wyman - Global Fleet And MRO Market Forecast 2026-2036: Key Trends
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.

12.5. Research & Development Organizations

Table 110. Global Nickel-Based Superalloys for Aerospace Market Size, by Research & Development Organizations, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 111. Global Nickel-Based Superalloys for Aerospace Market Size, by Research & Development Organizations, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 112. Global Nickel-Based Superalloys for Aerospace Market Size, by Research & Development Organizations, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. NASA and Superalloys: A Customer, a Participant, and a Referee
   · Taxonomy evidence: The paper distinguishes research participants and funded industry/university development roles. Funding responsibility does not identify the recipient of every material purchase. ([ntrs.nasa.gov](https://ntrs.nasa.gov/citations/xx.xx))
2. North American Industry Classification System, United States, 2022
   · Taxonomy evidence: Aerospace R&D outside prototype production is separately cross-referenced, demonstrating why research activity and manufacturing output should not be conflated. ([census.gov](https://www.census.gov/naics/reference_files_tools/2022_NAICS_Manual.pdf))
3. Development and validation of a powder HIP route for high temperature Astroloy to manufacture Ultrafan® IP Turbine Casings
   · Taxonomy evidence: The official project record identifies a technological research organization coordinating the aerospace-material development activity; it does not disclose every material-order recipient. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting))

4. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
5. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
6. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
7. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
8. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
9. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.

10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
11. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
12. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
13. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

14. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
15. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
16. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
17. UKRI - Accelerating Manufacturing Readiness level of ABD-1000AM for AM of high temperature aerospace components (AMRAM1000)
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
18. German Aerospace Center (DLR) - Financing
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.

13. Nickel-Based Superalloys for Aerospace Market, by Fulfillment Model

[illegible] Physically stocked material can therefore support Order-Dedicated Supply when reserved against a customer obligation. Buyers seeking an immediate alternative should confirm availability for their own accepted requirement; buyers seeking continuity can accept dedicated reservations, but should agree release responsibility and responsibility for unused material.

[illegible] A component seller facing a firm customer deadline should obtain requirement-specific assurance and revisit it when the customer schedule changes. Dedicated coverage can reduce uncertainty while creating commitment exposure; accessible stock can preserve flexibility without guaranteeing future coverage.

Figure 20. Global Nickel-Based Superalloys for Aerospace Market Size, by Fulfillment Model, 2025 (%)

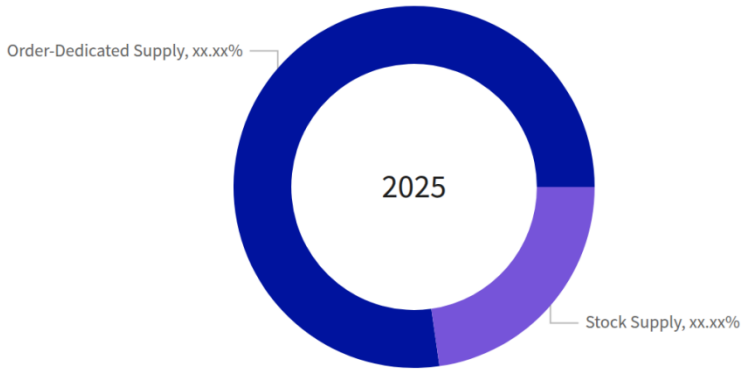

Figure 21. Global Nickel-Based Superalloys for Aerospace Market, by Fulfillment Model, 2032 (USD Million)

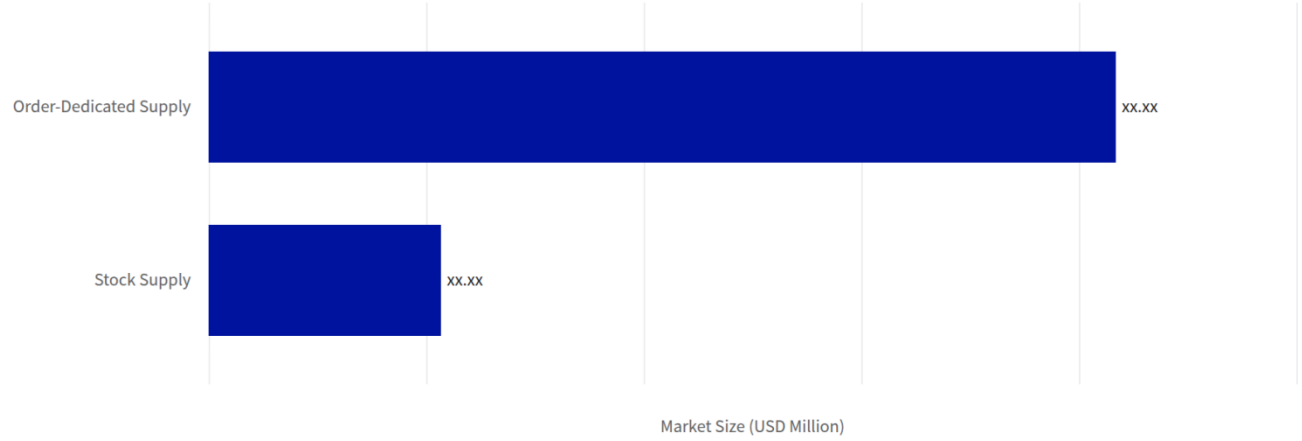

Table 113. Global Nickel-Based Superalloys for Aerospace Market, by Fulfillment Model growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Order-Dedicated Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stock Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 114. Global Nickel-Based Superalloys for Aerospace Market Size, by Fulfillment Model, 2017-2040 (USD Million)

Fulfillment Model	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Order-Dedicated Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stock Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Rolled Alloys - E-Services Stocking Programs

   · Rolled Alloys describes customer-site replenishment, supplier-held release arrangements, and scheduled programs requiring contract or long-term-agreement terms. These support distinguishing inventory location from customer allocation. ([rolledalloys.com](https://www.rolledalloys.com/eservices/))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.

2. Boeing BDS Terms and Conditions Guide - D604 Raw Material Risk Mitigation

   · Boeing D604 permits the authorized procurement representative to request raw-material assurance documentation, including stock records and mill assurances. Applicability is contractual. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D604_20180220.pdf))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.

3. Anticipated acquisition by Acerinox, S.A. of Haynes International, Inc. - Full text decision

   · Taxonomy evidence: Paragraphs xx.xx-xx.xx describe nickel-alloy stockholding, delivery availability, producer sales centers, and independent distributors. These are original supply-chain and customer findings, not the report's excluded market-data estimates.

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.

4. APICS CPIM 2019 - Part 1 Excerpt
   - Taxonomy evidence: The order-promising discussion distinguishes inventory-backed fulfillment from order-driven supply. The proposed binary taxonomy adapts these commercial concepts rather than reproducing every production-planning category.
5. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Confirmed backlog, expected conversion and annual sales provide an independent forward-commitment cross-check, not direct stock-share disclosure.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported orders and purchase-order/LTA recognition distinctions constrain the advance-commitment premise without measuring dedicated market share.
6. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
7. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
8. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical product revenue, channel mix and backlog conversion anchor the modeled stock value weight, with explicit scope adjustments.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Firm backlog and its distinction from short-notice service-center business constrain the complementary dedicated allocation.
9. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.

10. GE Aerospace - 2025 Sustainability Report
    - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
    - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
    - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
11. Carpenter Technology Corporation - Second Quarter Fiscal 2026 Earnings Call Presentation, January 29, 2026
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation distinguishes specialized non-LTA business from a conventional spot market, countering automatic classification of transactional sales as stock.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Three additional aerospace LTAs and xx.xx% sequential commercial-aerospace bookings growth inform the reservation hypothesis, but do not measure its modeled magnitude.

13.1. Order-Dedicated Supply

Table 115. Global Nickel-Based Superalloys for Aerospace Market Size, by Order-Dedicated Supply, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 116. Global Nickel-Based Superalloys for Aerospace Market Size, by Order-Dedicated Supply, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 117. Global Nickel-Based Superalloys for Aerospace Market Size, by Order-Dedicated Supply, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. APICS CPIM 2019 - Part 1 Excerpt
   - Taxonomy evidence: Make-to-order commitments consider material and capacity availability. This supports order-driven supply, but not a universal aerospace rule for reserved buffers.
2. AWI brings its largest ever range of high temperature alloys to Farnborough International Airshow
   - Taxonomy evidence: The company's aerospace business announcement describes made-to-order high-temperature alloy wire alongside held inventory. This corroborates a commercial example, not a market-wide fulfillment allocation.

3. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported orders and purchase-order/LTA recognition distinctions constrain the advance-commitment premise without measuring dedicated market share.
4. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
5. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
6. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Firm backlog and its distinction from short-notice service-center business constrain the complementary dedicated allocation.
7. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
8. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.

9. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
10. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
11. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
12. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

13. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
14. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
15. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
16. CMA - Anticipated Acquisition of Haynes International by Acerinox: Full Text Decision
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
17. Rolled Alloys - E-Services Stocking Programs
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
18. Boeing BDS Terms and Conditions Guide - D604 Raw Material Risk Mitigation
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
19. Carpenter Technology Corporation - Second Quarter Fiscal 2026 Earnings Call Presentation, January 29, 2026
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Three additional aerospace LTAs and xx.xx% sequential commercial-aerospace bookings growth inform the reservation hypothesis, but do not measure its modeled magnitude.

13.2. Stock Supply

Table 118. Global Nickel-Based Superalloys for Aerospace Market Size, by Stock Supply, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 119. Global Nickel-Based Superalloys for Aerospace Market Size, by Stock Supply, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 120. Global Nickel-Based Superalloys for Aerospace Market Size, by Stock Supply, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Anticipated acquisition by Acerinox, S.A. of Haynes International, Inc. - Full text decision
   - Taxonomy evidence: Nickel-alloy service centers hold inventory for customer delivery; customers identify stock availability as a purchasing consideration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
2. APICS CPIM 2019 - Part 1 Excerpt
   - Taxonomy evidence: The excerpt distinguishes available inventory from inventory already allocated or reserved.

3. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Confirmed backlog, expected conversion and annual sales provide an independent forward-commitment cross-check, not direct stock-share disclosure.
4. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
5. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
6. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical product revenue, channel mix and backlog conversion anchor the modeled stock value weight, with explicit scope adjustments.
7. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
8. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.

9. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
10. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
11. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
12. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

13. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
14. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
15. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
16. Rolled Alloys - E-Services Stocking Programs
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
17. Boeing BDS Terms and Conditions Guide - D604 Raw Material Risk Mitigation
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
18. Carpenter Technology Corporation - Second Quarter Fiscal 2026 Earnings Call Presentation, January 29, 2026
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation distinguishes specialized non-LTA business from a conventional spot market, countering automatic classification of transactional sales as stock.

14. Nickel-Based Superalloys for Aerospace Market, by Supply Channel

Producer-Direct Supply and Independent Intermediary Supply distinguish the commercial relationship, not whether inventory exists. ■■■ ■■■■■■■■■■■ ■■■ ■■■■■■■ ■■■■■■■■■■■ ■■■■■ ■■■■■■■■■■■■ ■■■■■■■■■■■■■ ■■■■■■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■ ■■■■■■■ ■■■■■ ■■ ■■■■■■■■■■■■■■■■■ ■■■■■■■ ■■■■■■■ ■■■■ ■■■■■■ ■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■ ■■■■■■■ ■■■■■■■ ■■■ ■■■■■■■■■■■■ ■■■■■■■ ■■■ ■■■ ■■■■■■■ ■■■■■■■■ ■■■■■■■■■■ ■■■■■■■ ■■■■ ■■■■■■■ ■■■■ ■■■■■■■■■■■■■■■■ ■■■■■ ■■■■■■■■■■ ■■■■■■■■■■■■■ An intermediary is useful when it provides an accepted offering and a better-suited fulfillment arrangement; a direct relationship remains preferable when the buyer needs a producer commitment the intermediary cannot substantiate.

■■■■■■■■ ■■■■■■■ ■■■■■■■■■■■ ■■ ■■■■■■■■■■ ■■■■■■■■ ■■■■■■■ ■■■■ ■■■■■■■■ ■■■■■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■ ■■■■ ■■■■■ ■■■■■■■■■■■■■ ■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■ ■■ ■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■■ ■■ ■■■■■■■■■■■■ ■■■■■ ■■■■ ■■■■■■■■■■ ■■ ■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■ ■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■ ■■ ■■ ■■■■■■■■■■■■■ Within the group, allocation responsibility matters; outside it, an executable external offer matters. Internal coordination can support continuity for affiliates without establishing availability to unaffiliated purchasers.

Licensing creates an additional channel distinction for proprietary offerings. ■■■■■■■ ■■■■■■■ ■■ ■■■ ■■■■■■■■■■ ■■■■■■■■■■ ■■■■■ ■■■■■■■ ■ ■■■■■■■ ■■■ ■■■■■■■ ■ ■■■■■ ■■■■■ ■■■■■■■■■■■ ■■■■■■■■ ■■■■■ ■■■■■■■■ ■■■■■■■■■■ ■ ■■■■■ ■■■■■■■ ■■■■■■■■■■■■■ ■■■ ■■■■■■■■■■ ■■■ ■■■ ■■■■■■■■■ ■■■■■ ■■■■■■■■■■ ■■ ■■■■■■■■ ■■■■■■■■ ■ ■■■■■■■■■■■ ■■■■■■■■■■■■■ ■■■■■■■ ■■■■■■■■■■ ■■■ ■■■■■■■ ■■■ ■■■■■■■ ■■■■■■■■■■■ ■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■■■■ Using an existing licensed route can avoid assuming independent commercialization rights, but retains dependence on the relevant rights holder and supplier.

Figure 22. Global Nickel-Based Superalloys for Aerospace Market Size, by Supply Channel, 2025 (%)

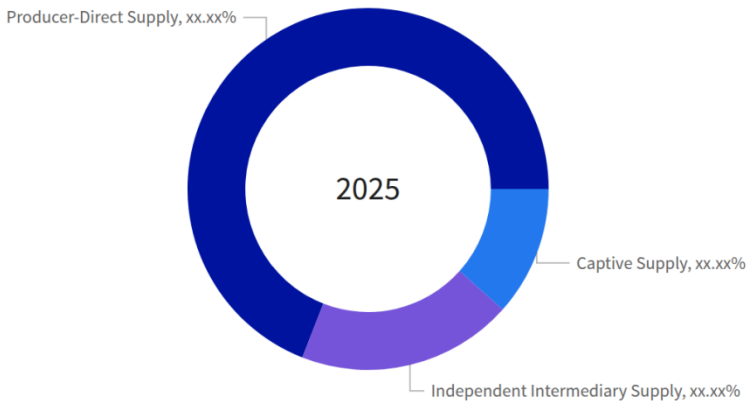

Figure 23. Global Nickel-Based Superalloys for Aerospace Market, by Supply Channel, 2032 (USD Million)

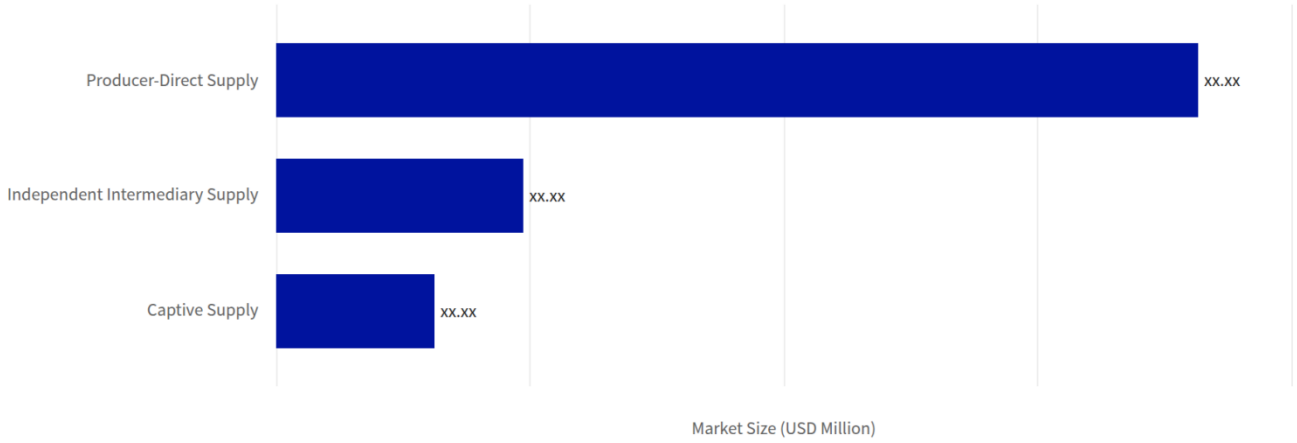

Table 121. Global Nickel-Based Superalloys for Aerospace Market, by Supply Channel growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Captive Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent Intermediary Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Producer-Direct Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 122. Global Nickel-Based Superalloys for Aerospace Market Size, by Supply Channel, 2017-2040 (USD Million)

Supply Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Captive Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent Intermediary Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Producer-Direct Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Alloyed - About

· Alloyed's history records a 2019 ABD licensing agreement with Aubert & Duval; it does not disclose the full grant available to unrelated sellers. ([alloyed.com](https://alloyed.com/about))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.

2. CMA - Anticipated Acquisition by Acerinox, S.A. of Haynes International, Inc.: Full Text Decision

· The CMA's 2024 investigation distinguishes manufacturer supply through production facilities or service centers from independent distributor and stockist supply. Only these original supply-chain observations are used. ([assets.publishing.service.gov.uk](https://assets.publishing.service.gov.uk/media/67370ebb65b6c2f3313e5d39/__Full_text_decision___.pdf))

· Taxonomy evidence: The investigation distinguishes manufacturer-direct supply from independent distributors and stockists. Its narrower geographic and product scope does not establish worldwide channel shares.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.

3. DPC Holdings Limited - Draft Registration Statement, April 14, 2026

· DPC's April xx.xx 2026 draft registration statement describes internal superalloy supply to affiliated aerospace casting facilities and external material sales. This supports distinct captive and external relationships, not unrestricted availability. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))

· Taxonomy evidence: The public registration-statement record distinguishes the issuer's internal superalloy supply from external superalloy sales. This corroborates captive material supply without establishing its global share.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.

4. Aubert & Duval - Stellar ABD-1000AM Powder for Additive Manufacturing
   · Aubert & Duval lists Stellar ABD-1000AM as a powder offering. A product listing does not disclose an unrelated intermediary's contractual rights. ([aubertduval.com](https://www.aubertduval.com/en/products/stellar-abd-1000am-powder-for-additive-manufacturing/))
5. ATI Inc. - 2025 Form 10-K
   · Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported AA&S external revenue supplies the inherited eligible-material weighting input; direct OEM agreements provide a commercial premise, not verification of forecast channel growth.
   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported AA&S external revenue supplies the inherited eligible-material weighting input; direct OEM agreements provide a commercial premise, not verification of forecast channel growth.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% of fiscal-2025 plate volume was sold to independent service centers; this broader product proxy is bridged to material value with explicit scope and realization assumptions.
   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% of fiscal-2025 plate volume was sold to independent service centers; this broader product proxy is bridged to material value with explicit scope and realization assumptions.
6. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   · Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
7. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   · Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.

8. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 revenue was approximately xx.xx% through the direct organization, including company-operated centers; this is a representative channel calibration, not a Global aerospace share.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 revenue was approximately xx.xx% through the direct organization, including company-operated centers; this is a representative channel calibration, not a Global aerospace share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% of fiscal-2023 revenue came through independent distributors, resellers and agents; the model separately assumes the title-taking portion.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% of fiscal-2023 revenue came through independent distributors, resellers and agents; the model separately assumes the title-taking portion.
9. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
10. GE Aerospace - 2025 Sustainability Report
    - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
    - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
    - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
11. Precision Castparts Corp. - Fiscal 2015 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
12. Rolled Alloys - E-Services Stocking Programs
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.

13. Precision Castparts Corp. - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.
14. Howmet Aerospace - United States Locations
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
15. ATI Inc. - 2024 Annual Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New sales commitments through 2040, including amounts expected during the remainder of the decade and predominantly involving jet-engine nickel alloys, inform the direct-program forecast premise without being counted as realized sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% of fiscal-2024 plate volume went to independent service centers, providing a historical comparison that cautions against assuming generalized intermediary displacement.

14.1. Producer-Direct Supply

Table 123. Global Nickel-Based Superalloys for Aerospace Market Size, by Producer-Direct Supply, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 124. Global Nickel-Based Superalloys for Aerospace Market Size, by Producer-Direct Supply, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 125. Global Nickel-Based Superalloys for Aerospace Market Size, by Producer-Direct Supply, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Anticipated acquisition by Acerinox, S.A. of Haynes International, Inc. - Full text decision
   - Taxonomy evidence: Manufacturer-direct supply includes sales through the manufacturer's service centers or sales offices.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
2. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported AA&S external revenue supplies the inherited eligible-material weighting input; direct OEM agreements provide a commercial premise, not verification of forecast channel growth.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported AA&S external revenue supplies the inherited eligible-material weighting input; direct OEM agreements provide a commercial premise, not verification of forecast channel growth.
3. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
4. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.

5. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 revenue was approximately xx.xx% through the direct organization, including company-operated centers; this is a representative channel calibration, not a Global aerospace share.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 revenue was approximately xx.xx% through the direct organization, including company-operated centers; this is a representative channel calibration, not a Global aerospace share.
6. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
7. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
8. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.

9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.
12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
13. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
14. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
15. ATI Inc. - 2024 Annual Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New sales commitments through 2040, including amounts expected during the remainder of the decade and predominantly involving jet-engine nickel alloys, inform the direct-program forecast premise without being counted as realized sales.

16. Alloyed - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.

14.2. Independent Intermediary Supply

Table 126. Global Nickel-Based Superalloys for Aerospace Market Size, by Independent Intermediary Supply, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 127. Global Nickel-Based Superalloys for Aerospace Market Size, by Independent Intermediary Supply, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 128. Global Nickel-Based Superalloys for Aerospace Market Size, by Independent Intermediary Supply, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Anticipated acquisition by Acerinox, S.A. of Haynes International, Inc. - Full text decision
   - Taxonomy evidence: Independent distributors and stockists are identified as an indirect nickel-alloy supply path.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.

2. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% of fiscal-2025 plate volume was sold to independent service centers; this broader product proxy is bridged to material value with explicit scope and realization assumptions.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% of fiscal-2025 plate volume was sold to independent service centers; this broader product proxy is bridged to material value with explicit scope and realization assumptions.
3. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
4. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
5. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% of fiscal-2023 revenue came through independent distributors, resellers and agents; the model separately assumes the title-taking portion.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% of fiscal-2023 revenue came through independent distributors, resellers and agents; the model separately assumes the title-taking portion.
6. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.

7. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
8. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
13. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
14. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
15. Rolled Alloys - E-Services Stocking Programs
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
16. ATI Inc. - 2024 Annual Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% of fiscal-2024 plate volume went to independent service centers, providing a historical comparison that cautions against assuming generalized intermediary displacement.
17. Alloyed - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.

14.3. Captive Supply

Table 129. Global Nickel-Based Superalloys for Aerospace Market Size, by Captive Supply, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 130. Global Nickel-Based Superalloys for Aerospace Market Size, by Captive Supply, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 131. Global Nickel-Based Superalloys for Aerospace Market Size, by Captive Supply, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. DPC Holdings Limited - Draft Registration Statement, April 14, 2026
   - Taxonomy evidence: The issuer describes supplying superalloy material internally to its affiliated aerospace and industrial-gas-turbine casting facilities; only the aerospace-directed material flow is relevant here.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.

2. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
3. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
4. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
5. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
6. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
7. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.

8. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
13. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
14. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
15. Precision Castparts Corp. - Fiscal 2015 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
16. Precision Castparts Corp. - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.
17. Howmet Aerospace - United States Locations
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.

15. Nickel-Based Superalloys for Aerospace Market, by Alloy Grade

Alloy Grade is a purchasing identity, not a sufficient statement of interchangeability. Special Metals lists aerospace offerings corresponding to Alloy xx.xx Alloy xx.xx Alloy xx.xx Alloy X-xx.xx Nimonic xx.xx Nimonic 80A, Nimonic xx.xx Udimet xx.xx and Waspaloy. ■■■■ ■■■■■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■ ■■■ ■■■■ ■■■ ■■■■■■■■■ ■■■■■ ■■■■■■■■■■ ■■■■■■■■■■■■ ■■ ■■■■■■■■ ■■■■■■■■■■■ ■■■■■ ■■■■■■ ■■■■ ■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■■■ ■■■ ■■■■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■ ■■■■■■■■■■■■■■■■■■■ ■■■■■■ ■■■■■■ ■■■■■■■ ■■■■■■ ■■■■ ■■■■■ ■■■■■■■■ ■■■ ■■■■■■■■■ ■■■■■■■■ ■■■ ■■■■■■■■■ ■■■■■■ ■■■■■■■■■■■■

Proprietary families and historical application records require different interpretation from a firm material offer. Cannon-Muskegon separately identifies CM247LC, CMSX-xx.xx and MAR-M xx.xx in its alloy history. ■■ ■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■ ■■■■ ■■ ■■■ ■■■■ ■■■■■■ ■■■■■■■■■ ■■■ ■■■■■■■■ ■■■■ ■■■■■■■■■■■ ■■■■■■■■ ■■■■■ ■■■■■■■ ■■■■■■■ ■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■ ■■■ ■■■■■■■■■■■■■ ■■■■■■■ ■■■■■ ■■■■ ■■■■■■■■■■■ ■■■■■■■■■■■■ ■ ■■■■■■ ■■■■■■■■■ ■■ ■■■■■■■■■■■ ■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■■■■■■■ ■■■■■■ ■ ■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■■ ■■■■■ ■■■■■ ■■ ■■■■■■■■■■■■ ■■■■■ ■■■ ■■■ ■■■■■■■■■ ■■■■■

Newer powder offerings can coexist with continuing aerospace-adoption work. Aubert & Duval lists ABD-1000AM Powder, while UKRI records Alloyed's AMRAM1000 project with an aerospace-readiness objective. ■■■■■■■■■■ ■■■■■■■ ■■■ ■■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■ ■■■■■■ ■■■■■■■■■ ■■■■■■■■■■ ■■■ ■■■■■■■■■ ■■■ ■■■■■■■■■■■ ■■■■■■ ■■■■■■ ■■■■■■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■■■ ■■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■ ■■■ ■■■■■■■■■ ■■■■■■■■■■ ■■■■ ■ ■■■■■■■■■■■■■■■■■■■■■■■ ■■■■■■■■ ■■ ■ ■■■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■■■■■■ ■■■ ■■■■■■ ■■■ ■■ ■■■■■■■ ■■ ■■■■■■■■ ■■ ■■■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■■■■■■

Exact variants also matter for retained identities such as IN-xx.xx and IN-738LC, and Udimet xx.xx and Udimet 720Li. ■■ ■■■■■■■■■■ ■■■■■■■■■ ■■■■■■ ■■■ ■■ ■■■■ ■■ ■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■ ■■■■■■ ■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■■■■■ ■■■■■■■ ■■■ ■■■■■■■■■ ■■■■■■ ■■■ ■■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■ ■■■■■■ ■■■■■■ ■■■ ■■■■■■■■■ ■■■■■■■■■■■ ■■■ ■■■ ■■■■■■■■■■■ ■■■■■■ ■■ ■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■ ■■■■■ ■■ ■■■■■■■■■■■■■■■■■■ ■■■■■■■■■■ The decision is to obtain a grade- and form-specific offer with the required acceptance and rights, rather than infer availability or equivalence from the breadth of the taxonomy.

Figure 24. Global Nickel-Based Superalloys for Aerospace Market Size, by Alloy Grade, 2025 (%)

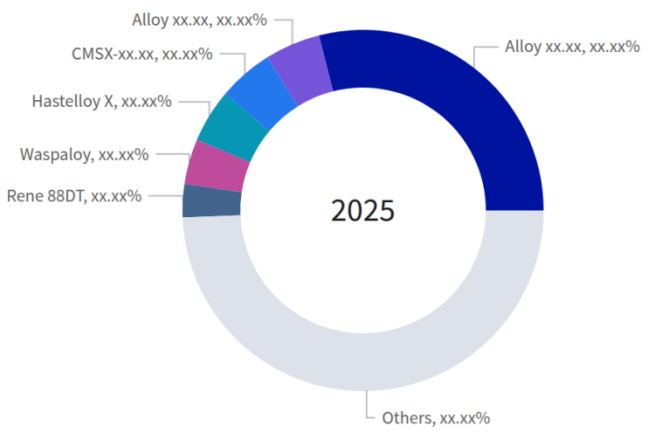

Figure 25. Global Nickel-Based Superalloys for Aerospace Market, by Alloy Grade, 2032 (USD Million)

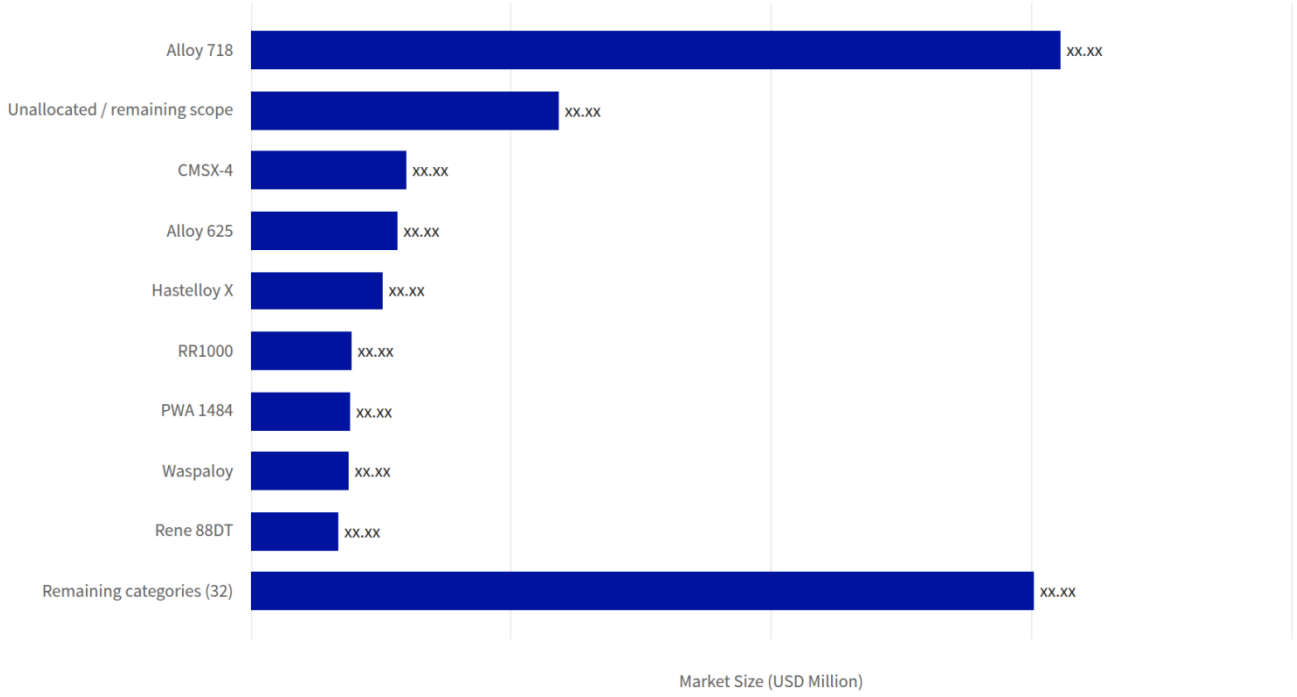

Table 132. Global Nickel-Based Superalloys for Aerospace Market, by Alloy Grade growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
ABD-1000AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
ABD-900AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
AD730	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 132 - continued

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Alloy 718Plus	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy X-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CM247LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CMSX-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hastelloy X	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713C	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-738LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
MAR-M xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic 80A	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene 88DT	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 132 - continued

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
RR1000	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet 720Li	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Unallocated / remaining scope	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Waspaloy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 133. Global Nickel-Based Superalloys for Aerospace Market Size, by Alloy Grade, 2017-2040 (USD Million)

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ABD-1000AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
ABD-900AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
AD730	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy 718Plus	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy X-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CM247LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CMSX-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hastelloy X	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713C	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 133 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
IN-738LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
MAR-M xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic 80A	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene 88DT	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
RR1000	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet 720Li	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Waspaloy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Special Metals - Aerospace

   · Special Metals lists the cited INCONEL, NIMONIC, UDIMET, and Waspaloy aerospace identities. The portfolio does not establish every form or buyer approval. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy xx.xx; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy X-xx.xx; no current sales quantity is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Waspaloy; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

2. Boeing BDS Terms and Conditions Guide - D607 Material Substitution Prohibition

   · Boeing D607 prohibits unauthorized substitutions, recognizes authorized alternatives, and makes deviations purchase-contract-specific. This supports exact-identity verification rather than inferred equivalence between retained variants. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause prohibits unauthorized substitutions where contractually applicable. It constrains the adoption interpretation but does not establish approval prevalence or a numerical adoption rate. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific material authorization is a counterweight to treating a named offering as immediately substitutable production material. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization limits interpretation of the assumed adoption multiplier; it does not directly establish powder sales. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))

3. Aubert & Duval - Stellar ABD-1000AM Powder for Additive Manufacturing

   · The named ABD-1000AM powder listing establishes an offering identity, not customer-specific production acceptance. ([aubertduval.com](https://www.aubertduval.com/en/products/stellar-abd-1000am-powder-for-additive-manufacturing/))

4. UKRI - Accelerating Manufacturing Readiness Level of ABD-1000AM for High Temperature Aerospace Components

   · UKRI records AMRAM1000, led by Alloyed Limited, with an ABD-1000AM aerospace-readiness objective. The project identity does not establish customer production acceptance. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))

5. Cannon-Muskegon - Alloy Development
   - Cannon-Muskegon's history separately names CM xx.xx LC, CMSX-xx.xx and MAR M xx.xx. Historical application records do not establish a current order-specific offer. ([cannonmuskegon.com](https://www.cannonmuskegon.com/products/alloy-development/))
6. GE Aerospace - Safety First: A Retiring GE Aerospace Materials Engineer Made Protecting Lives His Mission
   - GE's April xx.xx 2023 history separately identifies Rene xx.xx and Rene 88DT and associates the latter with GE90 application history; it does not grant substitution permission. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
7. Anticipated acquisition by Acerinox, S.A. of Haynes International, Inc. - Full text decision
   - Taxonomy evidence: The decision identifies UNS as a widely accepted grade-designation framework. It does not establish equivalence among all proprietary or nationally named grades in this aerospace taxonomy. ([assets.publishing.service.gov.uk](https://assets.publishing.service.gov.uk/media/67370ebb65b6c2f3313e5d39/__Full_text_decision___.pdf))
8. Chapter 2: Aerospace Materials Characteristics
   - Taxonomy evidence: Section xx.xx provides illustrative aerospace superalloy identities, not an exhaustive commercial grade census.
9. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
10. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
11. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.

12. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
13. Howmet Aerospace Inc. - 2025 Form 10-K
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
14. GE Aerospace - 2025 Sustainability Report
    - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
    - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
    - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
15. Rolls-Royce Holdings Plc - 2025 Full Year Results
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The divergence between 2025 engine deliveries and shop visits independently challenges a uniform new-engine-led material forecast; no service revenue is included in the numerator. ([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Observed engine-delivery and shop-visit activity supports separate new-program and replacement-demand assumptions, not a proportional material-purchase conversion. ([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

16. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 aerospace realization and revenue provide the common monetary calibration for this modeled grade; neither is a grade-specific sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace material realization supplies a price-scale input, with modeled year and product-mix adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization calibrates the assumed blended material price, not this grade's observed revenue. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace realization provides a shared monetary comparison for the assumed grade price. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported eight-to-ten-year aerospace application-introduction periods constrain interpretation of the seven-year adoption forecast. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace application-introduction periods provide an adoption-delay counterweight, not a forecast sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
17. European Commission CORDIS - Welding Metallurgy and Cracking in Superalloys: Reporting
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical all-sector tonnage discussion is only a dominance cross-check; it cannot establish current aerospace monetary share. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies 718Plus separately from ordinary xx.xx supporting identity separation without supplying a current sales weight. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
18. Special Metals - Alloy Surcharge Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: August-October 2026 grade surcharges provide a differentiated cost-exposure check, not full invoice prices or observed 2032 prices. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx surcharge sequence independently qualifies a uniform price assumption; it is not substituted for a material selling price. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The grade-specific surcharge listing is a commercial cost comparison, not an observed Global grade realization. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))

19. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current-and-past supplier identity mapping only; not proof of 2025 aerospace sales or the modeled volume. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: CMSX-xx.xx is separately identified; the material-value weight remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current sales are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713C is listed separately from IN-713LC; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713LC is listed separately from IN-713C; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx identity mapping only; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-738LC is separately identified; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current aerospace tonnes are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx appears in a current-and-past identification list; this does not establish recurring aerospace production sales. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MAR-M xx.xx is identified separately from CM247LC; monetary weights remain modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PWA xx.xx is separately identified; no attributable sales value is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; current commercial scale remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; no current grade-specific material sales are disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Udimet xx.xx appears in the supplier's current-and-past identities; aerospace attribution is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

20. Aubert & Duval - AD730: Ni-Based Superalloy for High Temperature Applications
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
21. University of Portsmouth - Improved Creep-Fatigue-Oxidation Resistance in Gas Turbine Disc Materials: REF Impact Case Study
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
22. Influence of Long Term Exposure in Air on Microstructure, Surface Stability and Mechanical Properties of UDIMET 720LI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The aerospace-industry publication distinguishes conventional Udimet xx.xx from its 720Li derivative; it does not establish a current monetary allocation. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The publication independently supports the 720Li identity and aircraft-engine-disc category, without supplying current sales. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))
23. NASA Contractor Report 174639 - Literature Survey on Oxidations and Fatigue Lives at Elevated Temperatures
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical institutional material identification is a legacy-category anchor only; it does not demonstrate current aerospace material sales. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

24. America Makes - 5566.002 Proliferation of Nickel Superalloy Material Datasets for Powder Bed Fusion Additive Manufacturing
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))
25. GE Aerospace - Fourth Quarter 2025 Earnings Presentation
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 commercial-engine delivery growth supplies a near-term demand cross-check, not a grade-specific purchasing or seven-year growth observation. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aggregate commercial and defense delivery growth constrains the commercial-demand scenario without establishing this grade's attributable consumption. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported defense-engine delivery growth is a demand-exposure check only; the PWA xx.xx activity factor remains assumed. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

15.1. Alloy 718

Table 134. Global Nickel-Based Superalloys for Aerospace Market Size, by Alloy xx.xx by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 135. Global Nickel-Based Superalloys for Aerospace Market Size, by Alloy xx.xx by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 136. Global Nickel-Based Superalloys for Aerospace Market Size, by Alloy xx.xx by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. JSC 27301H

   · Taxonomy evidence: Section xx.xx.xx.xx identifies Inconel xx.xx as a superalloy example in spacecraft material requirements.

2. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
3. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
4. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
5. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
6. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
7. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.

8. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
13. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
14. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
15. Special Metals - Aerospace
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy xx.xx; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
16. European Commission CORDIS - Welding Metallurgy and Cracking in Superalloys: Reporting
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical all-sector tonnage discussion is only a dominance cross-check; it cannot establish current aerospace monetary share. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
17. Special Metals - Alloy Surcharge Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx surcharge sequence independently qualifies a uniform price assumption; it is not substituted for a material selling price. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
18. GE Aerospace - Fourth Quarter 2025 Earnings Presentation
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 commercial-engine delivery growth supplies a near-term demand cross-check, not a grade-specific purchasing or seven-year growth observation. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

15.2. Alloy 625

Table 137. Global Nickel-Based Superalloys for Aerospace Market Size, by Alloy xx.xx by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 138. Global Nickel-Based Superalloys for Aerospace Market Size, by Alloy xx.xx by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 139. Global Nickel-Based Superalloys for Aerospace Market Size, by Alloy xx.xx by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. JSC 27301H
   - Taxonomy evidence: Section xx.xx.xx.xx identifies Inconel xx.xx as a superalloy example in spacecraft material requirements.
2. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
3. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.

4. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
5. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
6. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
7. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
8. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.

9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.
12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
13. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
14. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
15. Special Metals - Aerospace
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy xx.xx; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

15.3. CMSX-4

Table 140. Global Nickel-Based Superalloys for Aerospace Market Size, by CMSX-xx.xx by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 141. Global Nickel-Based Superalloys for Aerospace Market Size, by CMSX-xx.xx by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 142. Global Nickel-Based Superalloys for Aerospace Market Size, by CMSX-xx.xx by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Chapter 2: Aerospace Materials Characteristics
   - Taxonomy evidence: Listed aerospace nickel-base grade.
2. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
3. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.

4. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
5. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
6. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
7. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
8. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.

9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.
12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
13. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
14. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
15. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: CMSX-xx.xx is separately identified; the material-value weight remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

16. GE Aerospace - Fourth Quarter 2025 Earnings Presentation
· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aggregate commercial and defense delivery growth constrains the commercial-demand scenario without establishing this grade's attributable consumption.
([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

15.4. Hastelloy X

Table 143. Global Nickel-Based Superalloys for Aerospace Market Size, by Hastelloy X, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 144. Global Nickel-Based Superalloys for Aerospace Market Size, by Hastelloy X, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 145. Global Nickel-Based Superalloys for Aerospace Market Size, by Hastelloy X, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Chapter 2: Aerospace Materials Characteristics
   - Taxonomy evidence: Listed aerospace superalloy grade.
2. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
3. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.

4. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
5. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
6. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
7. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
8. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.

9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.
12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
13. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
14. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
15. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace material realization supplies a price-scale input, with modeled year and product-mix adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))

15.5. Waspaloy

Table 146. Global Nickel-Based Superalloys for Aerospace Market Size, by Waspaloy, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 147. Global Nickel-Based Superalloys for Aerospace Market Size, by Waspaloy, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 148. Global Nickel-Based Superalloys for Aerospace Market Size, by Waspaloy, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Chapter 2: Aerospace Materials Characteristics
   - Taxonomy evidence: Listed aerospace nickel-base grade.
2. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
3. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.

4. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
5. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
6. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
7. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
8. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.

9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.
12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
13. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
14. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
15. Special Metals - Aerospace
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Waspaloy; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

15.6. Rene 88DT

Table 149. Global Nickel-Based Superalloys for Aerospace Market Size, by Rene 88DT, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 150. Global Nickel-Based Superalloys for Aerospace Market Size, by Rene 88DT, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 151. Global Nickel-Based Superalloys for Aerospace Market Size, by Rene 88DT, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Chapter 2: Aerospace Materials Characteristics
   - Taxonomy evidence: Listed aerospace nickel-base grade.
2. Safety First: A Retiring GE Aerospace Materials Engineer Made Protecting Lives His Mission
   - Taxonomy evidence: The manufacturer identifies Rene 88DT in its GE90 material history.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))

3. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
4. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
5. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
6. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
7. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
8. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.

9. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
10. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
11. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
12. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

13. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
14. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
15. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.

15.7. RR1000

Table 152. Global Nickel-Based Superalloys for Aerospace Market Size, by RR1000, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 153. Global Nickel-Based Superalloys for Aerospace Market Size, by RR1000, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 154. Global Nickel-Based Superalloys for Aerospace Market Size, by RR1000, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Improved Creep-Fatigue-Oxidation Resistance in Gas Turbine Disc Materials
   - Taxonomy evidence: The institutional impact record identifies RR1000 adoption in Rolls-Royce aero-engines.

2. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
3. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
4. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
5. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
6. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
7. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.

8. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
13. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
14. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
15. Rolls-Royce Holdings Plc - 2025 Full Year Results
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The divergence between 2025 engine deliveries and shop visits independently challenges a uniform new-engine-led material forecast; no service revenue is included in the numerator. ([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
16. University of Portsmouth - Improved Creep-Fatigue-Oxidation Resistance in Gas Turbine Disc Materials: REF Impact Case Study
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))

15.8. PWA 1484

Table 155. Global Nickel-Based Superalloys for Aerospace Market Size, by PWA xx.xx by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 156. Global Nickel-Based Superalloys for Aerospace Market Size, by PWA xx.xx by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 157. Global Nickel-Based Superalloys for Aerospace Market Size, by PWA xx.xx by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
2. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.

3. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
4. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
5. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
6. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
7. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.

8. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
9. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
10. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.
11. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
12. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
13. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
14. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PWA xx.xx is separately identified; no attributable sales value is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

15. GE Aerospace - Fourth Quarter 2025 Earnings Presentation
· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported defense-engine delivery growth is a demand-exposure check only; the PWA xx.xx activity factor remains assumed.
([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

15.9. Haynes 230

Table 158. Global Nickel-Based Superalloys for Aerospace Market Size, by Haynes xx.xx by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 159. Global Nickel-Based Superalloys for Aerospace Market Size, by Haynes xx.xx by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 160. Global Nickel-Based Superalloys for Aerospace Market Size, by Haynes xx.xx by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. AIAA-2024-0997
   - Taxonomy evidence: The aerospace propulsion discussion explicitly identifies Haynes xx.xx among established superalloys.
2. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
3. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.

4. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
5. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
6. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
7. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
8. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.

9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.
12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
13. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
14. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
15. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization calibrates the assumed blended material price, not this grade's observed revenue. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))

15.10. Udimet 720Li

Table 161. Global Nickel-Based Superalloys for Aerospace Market Size, by Udimet 720Li, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 162. Global Nickel-Based Superalloys for Aerospace Market Size, by Udimet 720Li, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 163. Global Nickel-Based Superalloys for Aerospace Market Size, by Udimet 720Li, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Influence of Long Term Exposure in Air on Microstructure, Surface Stability and Mechanical Properties of UDIMET 720LI

   · Taxonomy evidence: The aerospace-engine authors explicitly pair UDIMET 720LI with the abbreviation U720LI and identify compressor- and turbine-disk applications, resolving the captured nomenclature inference. This 2000 record does not establish current material sales. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The publication independently supports the 720Li identity and aircraft-engine-disc category, without supplying current sales. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

2. Improved Creep-Fatigue-Oxidation Resistance in Gas Turbine Disc Materials

   · Taxonomy evidence: The record identifies U720Li and aero-engine adoption. Equating that abbreviation with the displayed Udimet 720Li designation remains an explicit nomenclature inference.

3. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
4. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
5. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
6. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
7. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
8. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.

9. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
10. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
11. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
12. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

13. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
14. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
15. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
16. Rolls-Royce Holdings Plc - 2025 Full Year Results
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Observed engine-delivery and shop-visit activity supports separate new-program and replacement-demand assumptions, not a proportional material-purchase conversion. ([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
17. University of Portsmouth - Improved Creep-Fatigue-Oxidation Resistance in Gas Turbine Disc Materials: REF Impact Case Study
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))

15.11. CM247LC

Table 164. Global Nickel-Based Superalloys for Aerospace Market Size, by CM247LC, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 165. Global Nickel-Based Superalloys for Aerospace Market Size, by CM247LC, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 166. Global Nickel-Based Superalloys for Aerospace Market Size, by CM247LC, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
2. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.

3. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
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   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
5. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
6. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
7. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.

8. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
9. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
10. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.
11. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
12. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
13. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
14. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current-and-past supplier identity mapping only; not proof of 2025 aerospace sales or the modeled volume. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

15.12. Alloy 263

Table 167. Global Nickel-Based Superalloys for Aerospace Market Size, by Alloy xx.xx by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 168. Global Nickel-Based Superalloys for Aerospace Market Size, by Alloy xx.xx by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 169. Global Nickel-Based Superalloys for Aerospace Market Size, by Alloy xx.xx by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Browse Topic: Vacuum
   - Taxonomy evidence: AMS5966D explicitly names Alloy xx.xx.
2. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
3. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.

4. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
5. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
6. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
7. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
8. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.

9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.
12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
13. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
14. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
15. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 aerospace realization and revenue provide the common monetary calibration for this modeled grade; neither is a grade-specific sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))

16. Special Metals - Alloy Surcharge Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: August-October 2026 grade surcharges provide a differentiated cost-exposure check, not full invoice prices or observed 2032 prices.
    ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))

15.13. IN-100

Table 170. Global Nickel-Based Superalloys for Aerospace Market Size, by IN-xx.xx by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 171. Global Nickel-Based Superalloys for Aerospace Market Size, by IN-xx.xx by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 172. Global Nickel-Based Superalloys for Aerospace Market Size, by IN-xx.xx by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Literature Survey on Oxidations and Fatigue Lives at Elevated Temperatures
   - Taxonomy evidence: Identifies IN-xx.xx among nickel-base superalloys; current aerospace trade is not established.
2. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
3. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.

4. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
5. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
6. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
7. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
8. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.

9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.
12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
13. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
14. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
15. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current sales are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

15.14. MAR-M 247

Table 173. Global Nickel-Based Superalloys for Aerospace Market Size, by MAR-M xx.xx by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 174. Global Nickel-Based Superalloys for Aerospace Market Size, by MAR-M xx.xx by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 175. Global Nickel-Based Superalloys for Aerospace Market Size, by MAR-M xx.xx by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. JSC 27301H
   - Taxonomy evidence: Section xx.xx.xx.xx identifies Mar-M-xx.xx as a superalloy example. This establishes grade relevance, not inclusion of component sales value.
2. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
3. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.

4. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
5. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
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6. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
7. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
8. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
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   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.

9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.
12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
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    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
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    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
13. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
14. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
15. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MAR-M xx.xx is identified separately from CM247LC; monetary weights remain modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

15.15. Rene 65

Table 176. Global Nickel-Based Superalloys for Aerospace Market Size, by Rene xx.xx by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 177. Global Nickel-Based Superalloys for Aerospace Market Size, by Rene xx.xx by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 178. Global Nickel-Based Superalloys for Aerospace Market Size, by Rene xx.xx by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Safety First: A Retiring GE Aerospace Materials Engineer Made Protecting Lives His Mission

   · Taxonomy evidence: The engine manufacturer distinguishes Rene xx.xx from Rene 88DT despite shared chemistry, supporting retention as separate recognized grade identities.

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))

2. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
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   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
4. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
5. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
6. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
7. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.

8. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
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    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.

15.16. IN-792

Table 179. Global Nickel-Based Superalloys for Aerospace Market Size, by IN-xx.xx by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 180. Global Nickel-Based Superalloys for Aerospace Market Size, by IN-xx.xx by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 181. Global Nickel-Based Superalloys for Aerospace Market Size, by IN-xx.xx by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

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   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
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   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
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   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
8. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
9. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
10. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
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11. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
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    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
12. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
13. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
14. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current aerospace tonnes are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

15.17. Rene 80

Table 182. Global Nickel-Based Superalloys for Aerospace Market Size, by Rene xx.xx by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 183. Global Nickel-Based Superalloys for Aerospace Market Size, by Rene xx.xx by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 184. Global Nickel-Based Superalloys for Aerospace Market Size, by Rene xx.xx by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Literature Survey on Oxidations and Fatigue Lives at Elevated Temperatures
   - Taxonomy evidence: Identifies Rene xx.xx among nickel-base superalloys; current aerospace trade is not established.

2. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
3. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
4. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
5. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
6. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
7. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.

8. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
13. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
14. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
15. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; current commercial scale remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

15.18. PWA 1480

Table 185. Global Nickel-Based Superalloys for Aerospace Market Size, by PWA xx.xx by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 186. Global Nickel-Based Superalloys for Aerospace Market Size, by PWA xx.xx by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 187. Global Nickel-Based Superalloys for Aerospace Market Size, by PWA xx.xx by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Chapter 2: Aerospace Materials Characteristics
   - Taxonomy evidence: Named material identity; current commercial allocation is not established.

2. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
3. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
4. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
5. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
6. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
7. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.

8. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
13. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
14. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
15. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PWA xx.xx is separately identified; no attributable sales value is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

15.19. IN-713C

Table 188. Global Nickel-Based Superalloys for Aerospace Market Size, by IN-713C, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 189. Global Nickel-Based Superalloys for Aerospace Market Size, by IN-713C, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 190. Global Nickel-Based Superalloys for Aerospace Market Size, by IN-713C, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Literature Survey on Oxidations and Fatigue Lives at Elevated Temperatures
   - Taxonomy evidence: Names 713C; the IN-713C crosswalk and current aerospace trade remain unverified.

2. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
3. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
4. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
5. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
6. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
7. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.

8. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
13. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
14. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
15. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713C is listed separately from IN-713LC; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

15.20. Alloy X-750

Table 191. Global Nickel-Based Superalloys for Aerospace Market Size, by Alloy X-xx.xx by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 192. Global Nickel-Based Superalloys for Aerospace Market Size, by Alloy X-xx.xx by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 193. Global Nickel-Based Superalloys for Aerospace Market Size, by Alloy X-xx.xx by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Browse Topic: Vacuum

   · Taxonomy evidence: AMS5598G and AMS5583G name X750 in different material forms, supporting one grade identity across those forms.

2. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
3. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
4. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
5. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
6. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
7. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.

8. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
13. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
14. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
15. Special Metals - Aerospace
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy X-xx.xx; no current sales quantity is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

15.21. Alloy 706

Table 194. Global Nickel-Based Superalloys for Aerospace Market Size, by Alloy xx.xx by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 195. Global Nickel-Based Superalloys for Aerospace Market Size, by Alloy xx.xx by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 196. Global Nickel-Based Superalloys for Aerospace Market Size, by Alloy xx.xx by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Chapter 2: Aerospace Materials Characteristics

   · Taxonomy evidence: The chapter's superalloy material listing explicitly names Inconel xx.xx. It establishes a material-name anchor but not the full designation crosswalk or current aerospace commercial allocation. No experimental conditions are used for classification.
   ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

2. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
3. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
4. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
5. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
6. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
7. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.

8. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
13. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
14. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
15. Special Metals - Aerospace
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy xx.xx; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

15.22. Rene 41

Table 197. Global Nickel-Based Superalloys for Aerospace Market Size, by Rene xx.xx by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 198. Global Nickel-Based Superalloys for Aerospace Market Size, by Rene xx.xx by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 199. Global Nickel-Based Superalloys for Aerospace Market Size, by Rene xx.xx by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Browse Topic: Vacuum
   - Taxonomy evidence: AMS5545H explicitly names Rene xx.xx.

2. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
3. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
4. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
5. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
6. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
7. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.

8. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
13. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
14. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
15. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace realization provides a shared monetary comparison for the assumed grade price. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))

15.23. IN-713LC

Table 200. Global Nickel-Based Superalloys for Aerospace Market Size, by IN-713LC, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 201. Global Nickel-Based Superalloys for Aerospace Market Size, by IN-713LC, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 202. Global Nickel-Based Superalloys for Aerospace Market Size, by IN-713LC, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Chapter 2: Aerospace Materials Characteristics

   · Taxonomy evidence: The same listing explicitly names Inconel 713LC. This supports partial identity recognition for the retained IN-713LC category; exact normalization and current aerospace-destination trade remain unresolved. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

2. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
3. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
4. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
5. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
6. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
7. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.

8. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
13. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
14. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
15. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713LC is listed separately from IN-713C; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

15.24. Nimonic 80A

Table 203. Global Nickel-Based Superalloys for Aerospace Market Size, by Nimonic 80A, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 204. Global Nickel-Based Superalloys for Aerospace Market Size, by Nimonic 80A, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 205. Global Nickel-Based Superalloys for Aerospace Market Size, by Nimonic 80A, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
2. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
3. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
4. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
5. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
6. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.

7. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
8. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
9. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
10. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

11. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
12. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
13. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
14. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace realization provides a shared monetary comparison for the assumed grade price. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))

15.25. Alloy 718Plus

Table 206. Global Nickel-Based Superalloys for Aerospace Market Size, by Alloy 718Plus, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 207. Global Nickel-Based Superalloys for Aerospace Market Size, by Alloy 718Plus, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 208. Global Nickel-Based Superalloys for Aerospace Market Size, by Alloy 718Plus, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Browse Topic: Vacuum
   - Taxonomy evidence: AMS5960B explicitly names Alloy xx.xx+, separately from ordinary xx.xx references.

2. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
3. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
4. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
5. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
6. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
7. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.

8. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
13. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
14. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
15. Boeing - BDS Terms and Conditions Guide, D607 Material Substitution Prohibition, November 15, 2013
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause prohibits unauthorized substitutions where contractually applicable. It constrains the adoption interpretation but does not establish approval prevalence or a numerical adoption rate. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
16. European Commission CORDIS - Welding Metallurgy and Cracking in Superalloys: Reporting
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies 718Plus separately from ordinary xx.xx supporting identity separation without supplying a current sales weight. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))

15.26. Alloy 901

Table 209. Global Nickel-Based Superalloys for Aerospace Market Size, by Alloy xx.xx by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 210. Global Nickel-Based Superalloys for Aerospace Market Size, by Alloy xx.xx by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 211. Global Nickel-Based Superalloys for Aerospace Market Size, by Alloy xx.xx by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Browse Topic: Vacuum
   - Taxonomy evidence: AMS5661H names Alloy xx.xx as a nickel-iron material; its listed identity is consistent with the frozen nickel-predominant inclusion rule.
2. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
3. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.

4. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
5. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
6. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
7. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
8. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.

9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.
12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
13. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
14. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
15. Special Metals - Aerospace
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy xx.xx; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

15.27. Rene 95

Table 212. Global Nickel-Based Superalloys for Aerospace Market Size, by Rene xx.xx by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 213. Global Nickel-Based Superalloys for Aerospace Market Size, by Rene xx.xx by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 214. Global Nickel-Based Superalloys for Aerospace Market Size, by Rene xx.xx by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Chapter 2: Aerospace Materials Characteristics
   - Taxonomy evidence: Named material identity; current commercial allocation is not established.
2. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
3. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.

4. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
5. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
6. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
7. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
8. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.

9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.
12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
13. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
14. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
15. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; no current grade-specific material sales are disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

15.28. Udimet 720

Table 215. Global Nickel-Based Superalloys for Aerospace Market Size, by Udimet xx.xx by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 216. Global Nickel-Based Superalloys for Aerospace Market Size, by Udimet xx.xx by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 217. Global Nickel-Based Superalloys for Aerospace Market Size, by Udimet xx.xx by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Influence of Long Term Exposure in Air on Microstructure, Surface Stability and Mechanical Properties of UDIMET 720LI
   - Taxonomy evidence: The introduction distinguishes conventional UDIMET xx.xx from its 720LI derivative, supporting separate grade identities rather than automatic consolidation. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The aerospace-industry publication distinguishes conventional Udimet xx.xx from its 720Li derivative; it does not establish a current monetary allocation. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))
2. Chapter 2: Aerospace Materials Characteristics
   - Taxonomy evidence: Listed aerospace nickel-base grade.

3. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
4. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
5. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
6. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
7. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
8. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.

9. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
10. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
11. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
12. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

13. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
14. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
15. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
16. Special Metals - Alloy Surcharge Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The grade-specific surcharge listing is a commercial cost comparison, not an observed Global grade realization. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))

15.29. AD730

Table 218. Global Nickel-Based Superalloys for Aerospace Market Size, by AD730, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 219. Global Nickel-Based Superalloys for Aerospace Market Size, by AD730, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 220. Global Nickel-Based Superalloys for Aerospace Market Size, by AD730, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. New aircraft superalloy - CESAME Project

   · Taxonomy evidence: The European Commission's CESAME results record identifies AD730 as a separately named aircraft-engine alloy evaluated alongside U720Li in a project completed in 2015. This establishes historical aerospace-development relevance, not grade equivalence or current sales. ([cordis.europa.eu](https://cordis.europa.eu/article/id/xx.xx-new-aircraft-superalloy))

2. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
3. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
4. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
5. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
6. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
7. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.

8. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
13. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
14. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
15. Boeing - BDS Terms and Conditions Guide, D607 Material Substitution Prohibition, November 15, 2013
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific material authorization is a counterweight to treating a named offering as immediately substitutable production material. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
16. Aubert & Duval - AD730: Ni-Based Superalloy for High Temperature Applications
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))

15.30. Nimonic 75

Table 221. Global Nickel-Based Superalloys for Aerospace Market Size, by Nimonic xx.xx by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 222. Global Nickel-Based Superalloys for Aerospace Market Size, by Nimonic xx.xx by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 223. Global Nickel-Based Superalloys for Aerospace Market Size, by Nimonic xx.xx by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
2. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.

3. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
4. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
5. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
6. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
7. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.

8. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
9. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
10. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.
11. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
12. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
13. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
14. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace realization provides a shared monetary comparison for the assumed grade price. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))

15.31. Haynes 282

Table 224. Global Nickel-Based Superalloys for Aerospace Market Size, by Haynes xx.xx by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 225. Global Nickel-Based Superalloys for Aerospace Market Size, by Haynes xx.xx by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 226. Global Nickel-Based Superalloys for Aerospace Market Size, by Haynes xx.xx by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. AIAA-2024-0997
   - Taxonomy evidence: The aerospace propulsion discussion explicitly identifies Haynes xx.xx among established superalloys.
2. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
3. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.

4. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
5. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
6. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
7. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
8. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.

9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.
12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
13. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
14. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.

15. Haynes International, Inc. - 2023 Form 10-K
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))

15.32. IN-738LC

Table 227. Global Nickel-Based Superalloys for Aerospace Market Size, by IN-738LC, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 228. Global Nickel-Based Superalloys for Aerospace Market Size, by IN-738LC, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 229. Global Nickel-Based Superalloys for Aerospace Market Size, by IN-738LC, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
2. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.

3. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
4. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
5. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
6. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
7. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.

8. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
9. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
10. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.
11. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
12. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
13. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
14. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-738LC is separately identified; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

15.33. Nimonic 90

Table 230. Global Nickel-Based Superalloys for Aerospace Market Size, by Nimonic xx.xx by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 231. Global Nickel-Based Superalloys for Aerospace Market Size, by Nimonic xx.xx by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 232. Global Nickel-Based Superalloys for Aerospace Market Size, by Nimonic xx.xx by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
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   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
4. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
5. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
6. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
7. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.

8. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
9. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
10. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.
11. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
12. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
13. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
14. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace realization provides a shared monetary comparison for the assumed grade price. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))

15.34. Rene 77

Table 233. Global Nickel-Based Superalloys for Aerospace Market Size, by Rene xx.xx by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 234. Global Nickel-Based Superalloys for Aerospace Market Size, by Rene xx.xx by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 235. Global Nickel-Based Superalloys for Aerospace Market Size, by Rene xx.xx by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Chapter 2: Aerospace Materials Characteristics
   - Taxonomy evidence: Identified as an aero-engine blade alloy.
2. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
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   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
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   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
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   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.

9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.
12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
13. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
14. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
15. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; current commercial scale remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

15.35. IN-738

Table 236. Global Nickel-Based Superalloys for Aerospace Market Size, by IN-xx.xx by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 237. Global Nickel-Based Superalloys for Aerospace Market Size, by IN-xx.xx by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 238. Global Nickel-Based Superalloys for Aerospace Market Size, by IN-xx.xx by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Chapter 2: Aerospace Materials Characteristics
   - Taxonomy evidence: Listed aerospace nickel-base grade.
2. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
3. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.

4. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
5. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
6. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
7. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
8. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.

9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.
12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
13. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
14. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
15. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx identity mapping only; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

15.36. Udimet 700

Table 239. Global Nickel-Based Superalloys for Aerospace Market Size, by Udimet xx.xx by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 240. Global Nickel-Based Superalloys for Aerospace Market Size, by Udimet xx.xx by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 241. Global Nickel-Based Superalloys for Aerospace Market Size, by Udimet xx.xx by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Literature Survey on Oxidations and Fatigue Lives at Elevated Temperatures
   - Taxonomy evidence: Identifies Udimet xx.xx among nickel-base superalloys; current aerospace trade is not established.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical institutional material identification is a legacy-category anchor only; it does not demonstrate current aerospace material sales. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
2. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.

3. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
4. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
5. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
6. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
7. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
8. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.

9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.
12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
13. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
14. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.

15.37. Udimet 500

Table 242. Global Nickel-Based Superalloys for Aerospace Market Size, by Udimet xx.xx by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 243. Global Nickel-Based Superalloys for Aerospace Market Size, by Udimet xx.xx by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 244. Global Nickel-Based Superalloys for Aerospace Market Size, by Udimet xx.xx by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Literature Survey on Oxidations and Fatigue Lives at Elevated Temperatures
   - Taxonomy evidence: Identifies Udimet xx.xx among nickel-base superalloys; current aerospace trade is not established.
2. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
3. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.

4. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
5. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
6. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
7. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
8. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.

9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.
12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
13. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
14. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
15. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Udimet xx.xx appears in the supplier's current-and-past identities; aerospace attribution is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

15.38. IN-939

Table 245. Global Nickel-Based Superalloys for Aerospace Market Size, by IN-xx.xx by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 246. Global Nickel-Based Superalloys for Aerospace Market Size, by IN-xx.xx by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 247. Global Nickel-Based Superalloys for Aerospace Market Size, by IN-xx.xx by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Evaluation of the IN 939 Alloy for Large Aircraft Engine Structures

   · Taxonomy evidence: The 2004 aerospace-industry paper identifies IN xx.xx and evaluates its prospective use in large aircraft-engine structures, while distinguishing its established industrial-turbine background. It supports historical developmental relevance, not current aerospace commercial adoption. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2004/Superalloys_2004_441_450.pdf))

2. ATI Inc. - 2025 Form 10-K

   · Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.

3. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K

   · Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.

4. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
5. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
6. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
7. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
8. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.

9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.
12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
13. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
14. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
15. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx appears in a current-and-past identification list; this does not establish recurring aerospace production sales. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

15.39. ABD-900AM

Table 248. Global Nickel-Based Superalloys for Aerospace Market Size, by ABD-900AM, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 249. Global Nickel-Based Superalloys for Aerospace Market Size, by ABD-900AM, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 250. Global Nickel-Based Superalloys for Aerospace Market Size, by ABD-900AM, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. ASME International Gas Turbine Institute - 2026 Awards Program

   · Taxonomy evidence: The ASME 2026 awards program identifies paper GT2025-xx.xx as addressing ABD900AM qualification for turbine, aerospace, and energy applications. This independently establishes the exact named material's aerospace-qualification context, not production approval or sales. ([event.asme.org](https://event.asme.org/Events/media/library/resources/turbo/Turbo-2026-Awards-Program.pdf))

2. ATI Inc. - 2025 Form 10-K

   · Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.

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   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
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   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
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   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.

9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.
12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
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    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
15. Boeing - BDS Terms and Conditions Guide, D607 Material Substitution Prohibition, November 15, 2013
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization limits interpretation of the assumed adoption multiplier; it does not directly establish powder sales.
      ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))

16. Haynes International, Inc. - 2023 Form 10-K
· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported eight-to-ten-year aerospace application-introduction periods constrain interpretation of the seven-year adoption forecast. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
17. America Makes - 5566.002 Proliferation of Nickel Superalloy Material Datasets for Powder Bed Fusion Additive Manufacturing
· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))
· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))

15.40. ABD-1000AM

Table 251. Global Nickel-Based Superalloys for Aerospace Market Size, by ABD-1000AM, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 252. Global Nickel-Based Superalloys for Aerospace Market Size, by ABD-1000AM, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 253. Global Nickel-Based Superalloys for Aerospace Market Size, by ABD-1000AM, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Accelerating Manufacturing Readiness level of ABD®-1000AM for AM of high temperature aerospace components (AMRAM1000)

   · Taxonomy evidence: The Innovate UK project explicitly identifies ABD-1000AM and an aerospace-adoption development objective. Its April 2025-October 2026 funded period establishes developmental activity, not completed production adoption or recurring material sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))

2. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
3. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
4. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
5. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
6. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
7. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.

8. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
9. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
10. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
11. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

12. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
13. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
14. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
15. Boeing - BDS Terms and Conditions Guide, D607 Material Substitution Prohibition, November 15, 2013
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization limits interpretation of the assumed adoption multiplier; it does not directly establish powder sales. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
16. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace application-introduction periods provide an adoption-delay counterweight, not a forecast sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))

16. Nickel-Based Superalloys for Aerospace Market, by Region

[illegible] Buyers can compare these services with an order-dedicated arrangement, but should establish the originating producer, reserved allocation, and customer acceptance before relying on proximity. A regional warehouse addresses fulfillment location, not all sourcing conditions.

In Europe, supplier-controlled commercial representation can support cross-border purchasing. [illegible] Changing the commercial contact may preserve the original source; changing the producer can introduce a different approval question.

Asia-Pacific contains different service functions even within one producer's network. [illegible] Local representation can simplify communication while leaving fulfillment dependent on another location.

Latin America and Africa illustrate different downstream purchasing relationships. GE Aerospace identifies its wholly owned Celma maintenance business in Brazil, while Safran describes its Moroccan engine-maintenance operation as a partnership with Royal Air Maroc. [illegible]

In the Middle East, announced service expansion requires careful timing. [illegible] A supplier considering dedicated exposure should require an attributable purchasing requirement and confirmation of the applicable commercial milestone before treating the announcement as executable demand.

Figure 26. Global Nickel-Based Superalloys for Aerospace Market, by Region: Market share evolution, 2025-2032

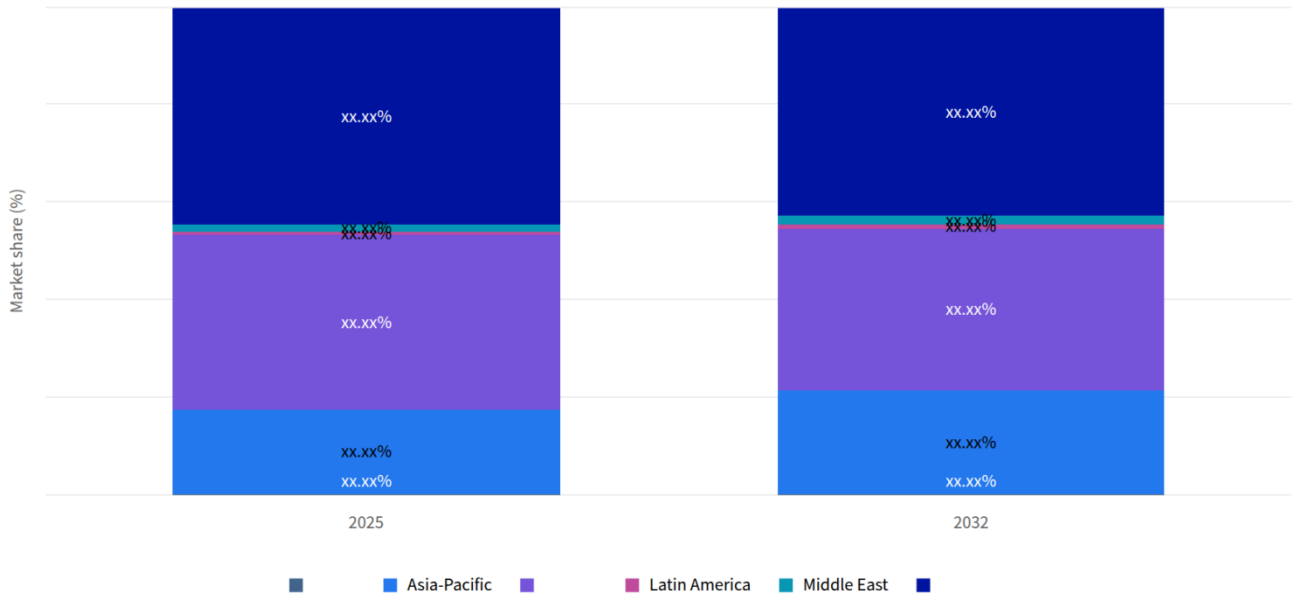

Figure 27. Global Nickel-Based Superalloys for Aerospace Market, by Region: Market size by category, 2025

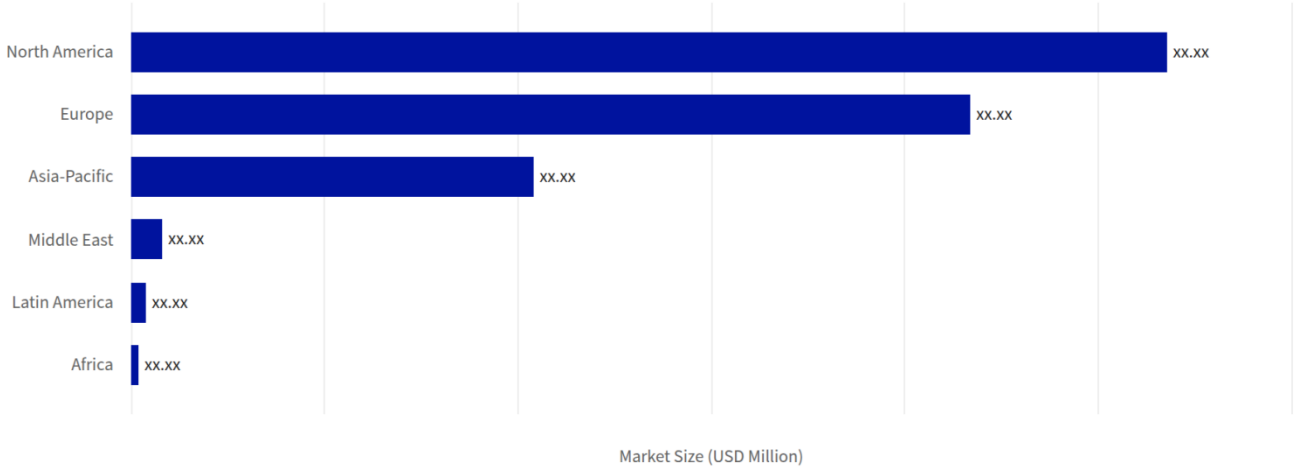

Figure 28. Global Nickel-Based Superalloys for Aerospace Market, Regional growth by Supply Channel, 2025-2032 (CAGR %)

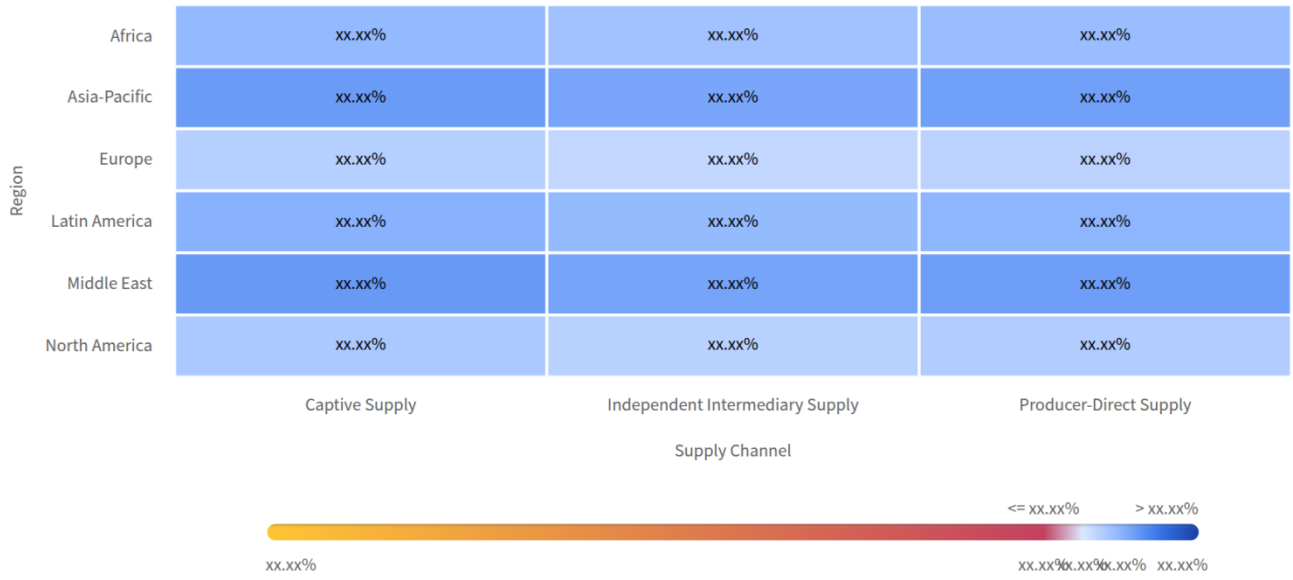

Table 254. Global Nickel-Based Superalloys for Aerospace Market, by Region growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 255. Global Nickel-Based Superalloys for Aerospace Market Size, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Haynes International - Sales and Service
   - Haynes describes North American service centers, on-demand delivery, and wholly owned European affiliates. These are service descriptions rather than individual delivery or source-eligibility commitments. ([haynesintl.com](https://haynesintl.com/en/sales-and-service/))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
2. Haynes International - Locations and Directions
   - Haynes identifies a China Sales & Service Center and sales offices in Japan and Singapore, supporting differentiation by documented commercial function rather than assumed equivalent stock. ([haynesintl.com](https://haynesintl.com/en/our-company/locations-and-directions/))
3. GE Aerospace - Commercial and Defense Engines in Latin America
   - GE identifies Celma in Brazil as its wholly owned maintenance business, supporting a named downstream purchasing setting rather than an inferred raw-material order. ([geaerospace.com](https://www.geaerospace.com/commercial-latam))
4. Safran - Safran Aircraft Engine Services Morocco
   - Safran describes its Moroccan engine-maintenance subsidiary as a partnership with Royal Air Maroc, establishing a different counterparty relationship from an entirely OEM-owned site. ([safran-group.com](https://www.safran-group.com/locations/morocco/safran-aircraft-engine-services-morocco-xx.xx))
5. Sanad - Expanded GE Aerospace and Safran LEAP Agreement in Abu Dhabi
   - Sanad's July xx.xx 2025 announcement expands its GE Aerospace and Safran LEAP offload agreement and targets complete covered overhaul capability by 2027. It is not a completion or material-award record. ([sanad.ae](https://www.sanad.ae/press-releases/sanad-ge-aerospace-and-safran-aircraft-engines-expand-partnership-to-launch-full-cfm-leap-engine-overhaul-and-test-capabilities-in-abu-dhabi/))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.

6. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
7. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
8. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
9. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
10. Howmet Aerospace Inc. - 2025 Form 10-K
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
11. GE Aerospace - 2025 Sustainability Report
    - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
    - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
    - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.

12. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
13. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
14. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.

16.1. North America

Table 256. North America Nickel-Based Superalloys for Aerospace Market, by Country growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Unallocated / remaining scope	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 257. North America Nickel-Based Superalloys for Aerospace Market Size, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 258. North America Nickel-Based Superalloys for Aerospace Market Size, by Product Form, 2017-2040 (USD Million)

Product Form	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Bars, Rods and Profiles	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Billets and Forging Stock	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ingots	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Plate, Sheet, Strip and Foil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Powder	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Tubes and Pipes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Wire	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 259. North America Nickel-Based Superalloys for Aerospace Market Size, by Strengthening Class, 2017-2040 (USD Million)

Strengthening Class	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Dispersion-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Precipitation-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Solid-Solution-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 260. North America Nickel-Based Superalloys for Aerospace Market Size, by Component Application, 2017-2040 (USD Million)

Component Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Breathing Propulsion & Auxiliary Power	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Systems & Equipment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rocket & Spacecraft Propulsion	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Vehicle Structures & Thermal Protection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 261. North America Nickel-Based Superalloys for Aerospace Market Size, by Air-Breathing Propulsion & Auxiliary Power, 2017-2040 (USD Million)

Air-Breathing Propulsion & Auxiliary Power	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combustion & Exhaust Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Compressor Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine Structures & Auxiliary Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Blades & Vanes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Disks & Rotor Hardware	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 262. North America Nickel-Based Superalloys for Aerospace Market Size, by Demand Stage, 2017-2040 (USD Million)

Demand Stage	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Initial Equipment Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Repair, Overhaul & Refurbishment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Replacement & Retrofit Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research, Development & Qualification	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 263. North America Nickel-Based Superalloys for Aerospace Market Size, by Aerospace End Market, 2017-2040 (USD Million)

Aerospace End Market	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Civil & Nonmilitary State Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Guided Missile Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Military Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Space Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 264. North America Nickel-Based Superalloys for Aerospace Market Size, by Buyer Function, 2017-2040 (USD Million)

Buyer Function	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Aerospace Vehicle Manufacturers & Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Component & Subassembly Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine & Propulsion-System Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Maintenance, Repair & Overhaul Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Development Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 265. North America Nickel-Based Superalloys for Aerospace Market Size, by Fulfillment Model, 2017-2040 (USD Million)

Fulfillment Model	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Order-Dedicated Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stock Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 266. North America Nickel-Based Superalloys for Aerospace Market Size, by Supply Channel, 2017-2040 (USD Million)

Supply Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Captive Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent Intermediary Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Producer-Direct Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 267. North America Nickel-Based Superalloys for Aerospace Market Size, by Alloy Grade, 2017-2040 (USD Million)

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ABD-1000AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
ABD-900AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
AD730	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy 718Plus	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy X-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CM247LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CMSX-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hastelloy X	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713C	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-738LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
MAR-M xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 267 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Nimonic 80A	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene 88DT	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
RR1000	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet 720Li	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Waspaloy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. ATI Inc. - 2025 Form 10-K

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: US and Canadian destination sales constrain the domestic-coverage calibration; business scope is broader than the target material.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC's reported financial/product-category inputs and listed ingot offering constrain the eligible material envelope; the ingot allocation remains assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: AA&S sales of USD xx.xx and its xx.xx% nickel-based/specialty-alloy category anchor the separately adjusted rolled-material envelope.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial

2. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
3. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Narrow-strip supply supports a limited flat-product allocation within the modeled eligible Carpenter envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire is a disclosed supplied form; its eligible monetary weight remains modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.

4. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical xx.xx% slab/bar/billet revenue category constrains the long-stock proxy; its eligible billet split is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported combined stock category provides a proxy anchor, not a separately disclosed bar revenue share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 flat products represented approximately xx.xx% of net product revenue; extrapolation to the eligible Acerinox envelope is modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 wire represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 tubulars represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical product revenue, channel mix and backlog conversion anchor the modeled stock value weight, with explicit scope adjustments.

5. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Casting-alloy activities support an ingot-material equivalent rather than attributing full engine-component revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed metal/billet activities support retaining a forging-stock allocation; the assumed xx.xx% weight is not reported.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported 2025 sales of USD xx.xx and Engine Products aerospace revenues of USD xx.xx commercial and USD xx.xx defense establish the component-cohort scale; USD xx.xx gas-turbine revenue is excluded through an explicit attribution model. These are not material-market revenues. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The segment/end-market revenue table supplies the aerospace and gas-turbine boundaries needed to bridge combined spares activity into an aerospace replacement-material proxy. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial aerospace represented xx.xx% of 2025 company sales, supplying an independent downstream mix comparison rather than a nickel-material allocation weight. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense aerospace represented xx.xx% of 2025 company sales; the paired commercial/defense comparison tests the aviation model while retaining component and material-scope differences. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.

6. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: GE describes repaired/serviceable-part reuse, supporting a counterforce to converting aftermarket activity directly into newly supplied material purchases. Its reported approximately xx.xx% strategic-nickel revert content is not deducted from the terminal-material market. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Commercial repair and component reuse support retaining uncertainty around replacement-related combustion material purchases. The selected procurement-intensity offset remains an assumption, not a measured avoided-purchase percentage. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
7. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Gross nickel-alloy bar/profile imports constrain the regional allocation proxy; aerospace and domestic-supply adjustments are modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
8. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input, discounted for product and industrial mix.

9. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-location revenue supports destination attribution and the North American cross-check; future allocation remains modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.
10. Haynes International - Sales and Service
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Service-center presence is a fulfillment premise, not a local-demand percentage or material-origin entitlement.
11. Special Metals - Tech Center
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised ingot supply establishes a PCC material-form crosswalk, not its sales weight.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised billet supply supports the forging-stock category mapping within the inherited PCC envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised bar supply supports classification only; the monetary coefficient is an assumption.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Plate, sheet and strip offerings support a distinct flat-product allocation premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire availability supports the material-form crosswalk without establishing revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Tubing availability supports the material-form crosswalk without establishing revenue.

12. DPC Holdings Limited - Registration Statement with 2025 Financial Statements
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing separates ingots from component sales and describes external supply and xx.xx% internal superalloy sourcing, contradicting the inherited xx.xx% captive parameter.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
13. Acerinox - Results FY 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned US long-product expansion supports the relative conventional-long-material premise; investment is not recognized as sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately USD xx.xx of planned platform investment includes expansion of the long-products offering, informing the bars forecast premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace demand and planned long-product diversification support testing a relative mix shift without assuming flat-product contraction.
14. Haynes International - HAYNES 282
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Powder is offered alongside conventional forms for HAYNES xx.xx supporting nonexclusive form classification, not an observed sales allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))

15. CMA - Anticipated Acquisition of Haynes International by Acerinox: Full Text Decision
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct customer evidence in paragraphs xx.xx-xx.xx supports separate flat/long purchasing pools; no published market-share table is used.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Shape-specific purchasing supports a distinct long-stock allocation model without proving a separate competitive market for billet.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
16. Haynes International - HAYNES 230
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))

17. Carpenter Technology - Advanced Materials for Aerospace Motor & Engines

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation.
([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation.
([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))

18. Elementum 3D - Metal Alloy Additive Manufacturing Colorado

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed.
([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed.
([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))

19. NASA - NASA-Developed Printable Metal Can Take the Heat

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake.
([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake.
([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

20. Carpenter Technology - Lighter, Faster, Stronger Metallurgy for Defense, July 2025

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

21. Special Metals - Aerospace
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy xx.xx; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy X-xx.xx; no current sales quantity is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Waspaloy; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

22. Boeing - BDS Terms and Conditions Guide, D607 Material Substitution Prohibition, November 15, 2013
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: D607 prohibits unauthorized material substitutions while recognizing specified alternatives. It constrains assumptions about frictionless cross-class substitution, without quantifying adoption delays. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization requirements qualify assumptions about precipitation-family substitution opportunities; the clause does not prove future purchases or a class-growth premium. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause prohibits unauthorized substitutions where contractually applicable. It constrains the adoption interpretation but does not establish approval prevalence or a numerical adoption rate. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific material authorization is a counterweight to treating a named offering as immediately substitutable production material. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization limits interpretation of the assumed adoption multiplier; it does not directly establish powder sales. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))

23. Precision Castparts Corp. - Fiscal 2015 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
24. NASA - Chapter 2: Aerospace Materials Characteristics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

25. ESA - ESA Space Environment Report 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
26. NASA and Superalloys: A Customer, a Participant, and a Referee
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
27. VDM Metals - Alloys for the Aerospace Industry
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
28. Carpenter Technology - Business Segments
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))

29. Howmet Aerospace - 2025 Annual Report, Letter to Shareholders

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% combined aerospace and gas-turbine spares revenue constrains the distinction between initial-production and spare-component activity; material and destination adjustments remain modeled. ([howmet.com](https://www.howmet.com/annualreport/))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed combined spares proportion supplies the replacement proxy; approximately xx.xx% commercial aerospace engine-spares growth is historical counterevidence against assuming weak aftermarket activity. ([howmet.com](https://www.howmet.com/annualreport/))

30. GE Aerospace - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment and services costs provide commercial budget anchors for the common material-value denominator; assumed eligible-material fractions prevent full equipment or service value from entering the allocation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Services include spare parts and maintenance activity, supporting an explicit new-article versus restoration attribution rather than equating services revenue with replacement-material purchases. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported USD xx.xx services cost anchors the restoration-material bridge; the restoration allocation and direct eligible-material fraction are assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Total funded R&D of USD xx.xx supplies a development-budget proxy, not observed nickel-material purchasing; only an assumed eligible-material fraction is used. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.

31. Rolls-Royce Holdings Plc - 2025 Full Year Results

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2028 shop-visit target is below the reported 2025 total despite prospective fleet growth, qualifying any automatic conversion of fleet expansion into proportionate maintenance-material purchasing.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The divergence between 2025 engine deliveries and shop visits independently challenges a uniform new-engine-led material forecast; no service revenue is included in the numerator.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Observed engine-delivery and shop-visit activity supports separate new-program and replacement-demand assumptions, not a proportional material-purchase conversion.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

32. UKRI - Accelerating Manufacturing Readiness level of ABD-1000AM for AM of high temperature aerospace components (AMRAM1000)
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The Alloyed-led project has xx.xx of funding and an April 2025-October 2026 funded period. This independently establishes bounded development activity, not annual material sales or recurring production purchases. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
33. Safran - FY 2025 Results and Investor Update, February 13, 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))

34. Airbus - Full-Year 2025 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 deliveries by aircraft family provide the starting activity comparison for the initial-production forecast; aircraft delivery value is not included in the material numerator. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx% decline in 2025 self-financed R&D is counterevidence to uniform development-budget acceleration and supports a restrained, explicitly assumed development-purchasing scenario. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.

35. Airbus - Half-Year 2026 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 update retained the A320-family, A350 and other production-rate targets, providing a dated commercial constraint on the initial-production activity scenario rather than proof of future material orders. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: First-half 2026 self-financed R&D of EUR xx.xx versus EUR xx.xx provides a modest-growth countercheck for the assumed development-project activity path; the budget is not material-market revenue. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))

36. RTX Corporation - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

37. Federal Reserve Bank of St. Louis - Annual USD/GBP Exchange Rate, AEXUSUK
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
38. L3Harris Technologies, Inc. - Fiscal 2025 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
39. FAA Aerospace Forecast Fiscal Years 2025-2045 - Commercial Space
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated official low/high scenarios provide FY2032 licensed launch/reentry activity bounds. Their U.S.-licensed scope and treatment of reusable vehicles prevent direct conversion into Global material revenue. ([faa.gov](https://www.faa.gov/data_research/aviation/aerospace_forecasts/2025-commercial-space.pdf))
40. ICAO - Convention on International Civil Aviation, Ninth Edition
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))

41. DFARS 252.225-7009 - Restriction on Acquisition of Certain Articles Containing Specialty Metals
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
42. Aubert & Duval - Space Industry Metallurgical Solutions
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
43. Aubert & Duval - Metallurgical Solutions for the Defense Industry, June 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
44. Berkshire Hathaway Inc. - 2025 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.

45. Lufthansa Group Annual Report 2025 - MRO business segment
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
46. Oliver Wyman - Global Fleet And MRO Market Forecast 2026-2036: Key Trends
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
47. German Aerospace Center (DLR) - Financing
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
48. Federal Aviation Administration - Parts Manufacturer Approval (PMA): Design Approval
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.

49. Rolled Alloys - E-Services Stocking Programs
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
50. Boeing BDS Terms and Conditions Guide - D604 Raw Material Risk Mitigation
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
51. Carpenter Technology Corporation - Second Quarter Fiscal 2026 Earnings Call Presentation, January 29, 2026
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation distinguishes specialized non-LTA business from a conventional spot market, countering automatic classification of transactional sales as stock.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Three additional aerospace LTAs and xx.xx% sequential commercial-aerospace bookings growth inform the reservation hypothesis, but do not measure its modeled magnitude.
52. Precision Castparts Corp. - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.

53. Howmet Aerospace - United States Locations
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
54. ATI Inc. - 2024 Annual Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New sales commitments through 2040, including amounts expected during the remainder of the decade and predominantly involving jet-engine nickel alloys, inform the direct-program forecast premise without being counted as realized sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% of fiscal-2024 plate volume went to independent service centers, providing a historical comparison that cautions against assuming generalized intermediary displacement.
55. Alloyed - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.

56. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 aerospace realization and revenue provide the common monetary calibration for this modeled grade; neither is a grade-specific sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace material realization supplies a price-scale input, with modeled year and product-mix adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization calibrates the assumed blended material price, not this grade's observed revenue. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace realization provides a shared monetary comparison for the assumed grade price. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported eight-to-ten-year aerospace application-introduction periods constrain interpretation of the seven-year adoption forecast. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace application-introduction periods provide an adoption-delay counterweight, not a forecast sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
57. European Commission CORDIS - Welding Metallurgy and Cracking in Superalloys: Reporting
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical all-sector tonnage discussion is only a dominance cross-check; it cannot establish current aerospace monetary share. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies 718Plus separately from ordinary xx.xx supporting identity separation without supplying a current sales weight. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
58. Special Metals - Alloy Surcharge Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: August-October 2026 grade surcharges provide a differentiated cost-exposure check, not full invoice prices or observed 2032 prices. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx surcharge sequence independently qualifies a uniform price assumption; it is not substituted for a material selling price. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The grade-specific surcharge listing is a commercial cost comparison, not an observed Global grade realization. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))

59. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current-and-past supplier identity mapping only; not proof of 2025 aerospace sales or the modeled volume. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: CMSX-xx.xx is separately identified; the material-value weight remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current sales are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713C is listed separately from IN-713LC; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713LC is listed separately from IN-713C; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx identity mapping only; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-738LC is separately identified; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current aerospace tonnes are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx appears in a current-and-past identification list; this does not establish recurring aerospace production sales. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: MAR-M xx.xx is identified separately from CM247LC; monetary weights remain modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PWA xx.xx is separately identified; no attributable sales value is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; current commercial scale remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; no current grade-specific material sales are disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Udimet xx.xx appears in the supplier's current-and-past identities; aerospace attribution is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

60. GE Aerospace - Safety First: A Retiring GE Aerospace Materials Engineer Made Protecting Lives His Mission
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
61. Aubert & Duval - AD730: Ni-Based Superalloy for High Temperature Applications
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
62. University of Portsmouth - Improved Creep-Fatigue-Oxidation Resistance in Gas Turbine Disc Materials: REF Impact Case Study
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))

63. Influence of Long Term Exposure in Air on Microstructure, Surface Stability and Mechanical Properties of UDIMET 720LI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The aerospace-industry publication distinguishes conventional Udimet xx.xx from its 720Li derivative; it does not establish a current monetary allocation. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The publication independently supports the 720Li identity and aircraft-engine-disc category, without supplying current sales. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

64. NASA Contractor Report 174639 - Literature Survey on Oxidations and Fatigue Lives at Elevated Temperatures

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical institutional material identification is a legacy-category anchor only; it does not demonstrate current aerospace material sales. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

65. America Makes - 5566.002 Proliferation of Nickel Superalloy Material Datasets for Powder Bed Fusion Additive Manufacturing

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))

66. GE Aerospace - Fourth Quarter 2025 Earnings Presentation

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 commercial-engine delivery growth supplies a near-term demand cross-check, not a grade-specific purchasing or seven-year growth observation. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aggregate commercial and defense delivery growth constrains the commercial-demand scenario without establishing this grade's attributable consumption. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported defense-engine delivery growth is a demand-exposure check only; the PWA xx.xx activity factor remains assumed. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

16.2. Europe

Table 268. Europe Nickel-Based Superalloys for Aerospace Market, by Country growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Austria	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Belgium	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Denmark	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Finland	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Netherlands	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Norway	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Poland	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Portugal	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Sweden	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Switzerland	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Unallocated / remaining scope	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 269. Europe Nickel-Based Superalloys for Aerospace Market Size, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Austria	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Belgium	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Denmark	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Finland	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Netherlands	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Norway	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Poland	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Portugal	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Sweden	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Switzerland	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 270. Europe Nickel-Based Superalloys for Aerospace Market Size, by Product Form, 2017-2040 (USD Million)

Product Form	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Bars, Rods and Profiles	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Billets and Forging Stock	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ingots	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Plate, Sheet, Strip and Foil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Powder	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Tubes and Pipes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Wire	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 271. Europe Nickel-Based Superalloys for Aerospace Market Size, by Strengthening Class, 2017-2040 (USD Million)

Strengthening Class	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Dispersion-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Precipitation-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Solid-Solution-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 272. Europe Nickel-Based Superalloys for Aerospace Market Size, by Component Application, 2017-2040 (USD Million)

Component Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Breathing Propulsion & Auxiliary Power	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Systems & Equipment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rocket & Spacecraft Propulsion	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Vehicle Structures & Thermal Protection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 273. Europe Nickel-Based Superalloys for Aerospace Market Size, by Air-Breathing Propulsion & Auxiliary Power, 2017-2040 (USD Million)

Air-Breathing Propulsion & Auxiliary Power	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combustion & Exhaust Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Compressor Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine Structures & Auxiliary Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Blades & Vanes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Disks & Rotor Hardware	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 274. Europe Nickel-Based Superalloys for Aerospace Market Size, by Demand Stage, 2017-2040 (USD Million)

Demand Stage	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Initial Equipment Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Repair, Overhaul & Refurbishment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Replacement & Retrofit Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research, Development & Qualification	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 275. Europe Nickel-Based Superalloys for Aerospace Market Size, by Aerospace End Market, 2017-2040 (USD Million)

Aerospace End Market	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Civil & Nonmilitary State Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Guided Missile Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Military Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Space Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 276. Europe Nickel-Based Superalloys for Aerospace Market Size, by Buyer Function, 2017-2040 (USD Million)

Buyer Function	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Aerospace Vehicle Manufacturers & Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Component & Subassembly Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine & Propulsion-System Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Maintenance, Repair & Overhaul Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Development Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 277. Europe Nickel-Based Superalloys for Aerospace Market Size, by Fulfillment Model, 2017-2040 (USD Million)

Fulfillment Model	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Order-Dedicated Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stock Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 278. Europe Nickel-Based Superalloys for Aerospace Market Size, by Supply Channel, 2017-2040 (USD Million)

Supply Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Captive Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent Intermediary Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Producer-Direct Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 279. Europe Nickel-Based Superalloys for Aerospace Market Size, by Alloy Grade, 2017-2040 (USD Million)

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ABD-1000AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
ABD-900AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
AD730	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy 718Plus	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy X-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CM247LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CMSX-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hastelloy X	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713C	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 279 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
IN-713LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-738LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
MAR-M xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic 80A	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene 88DT	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
RR1000	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet 720Li	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Waspaloy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. ATI Inc. - 2025 Form 10-K

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: European destination sales provide an independent broad-scope geographic check.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC's reported financial/product-category inputs and listed ingot offering constrain the eligible material envelope; the ingot allocation remains assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: AA&S sales of USD xx.xx and its xx.xx% nickel-based/specialty-alloy category anchor the separately adjusted rolled-material envelope.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial jet-engine revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025, supporting purchasing recovery but

2. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
3. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Narrow-strip supply supports a limited flat-product allocation within the modeled eligible Carpenter envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire is a disclosed supplied form; its eligible monetary weight remains modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.

4. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical xx.xx% slab/bar/billet revenue category constrains the long-stock proxy; its eligible billet split is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported combined stock category provides a proxy anchor, not a separately disclosed bar revenue share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 flat products represented approximately xx.xx% of net product revenue; extrapolation to the eligible Acerinox envelope is modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 wire represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 tubulars represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical product revenue, channel mix and backlog conversion anchor the modeled stock value weight, with explicit scope adjustments.

5. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Casting-alloy activities support an ingot-material equivalent rather than attributing full engine-component revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed metal/billet activities support retaining a forging-stock allocation; the assumed xx.xx% weight is not reported.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported 2025 sales of USD xx.xx and Engine Products aerospace revenues of USD xx.xx commercial and USD xx.xx defense establish the component-cohort scale; USD xx.xx gas-turbine revenue is excluded through an explicit attribution model. These are not material-market revenues. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The segment/end-market revenue table supplies the aerospace and gas-turbine boundaries needed to bridge combined spares activity into an aerospace replacement-material proxy. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial aerospace represented xx.xx% of 2025 company sales, supplying an independent downstream mix comparison rather than a nickel-material allocation weight. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense aerospace represented xx.xx% of 2025 company sales; the paired commercial/defense comparison tests the aviation model while retaining component and material-scope differences. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.

6. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: GE describes repaired/serviceable-part reuse, supporting a counterforce to converting aftermarket activity directly into newly supplied material purchases. Its reported approximately xx.xx% strategic-nickel revert content is not deducted from the terminal-material market. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Commercial repair and component reuse support retaining uncertainty around replacement-related combustion material purchases. The selected procurement-intensity offset remains an assumption, not a measured avoided-purchase percentage. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
7. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input; EU aggregate excluded from country summation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
8. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Austria input requires a substantial non-aerospace mix adjustment.
9. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
10. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European customer revenue constrains the geographic comparison, not an observed market share.

11. Haynes International - Sales and Service
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-owned European representation qualifies the use of commercial-office locations as demand weights.
12. Special Metals - Tech Center
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised ingot supply establishes a PCC material-form crosswalk, not its sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised billet supply supports the forging-stock category mapping within the inherited PCC envelope.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised bar supply supports classification only; the monetary coefficient is an assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Plate, sheet and strip offerings support a distinct flat-product allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire availability supports the material-form crosswalk without establishing revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Tubing availability supports the material-form crosswalk without establishing revenue.
13. DPC Holdings Limited - Registration Statement with 2025 Financial Statements
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing separates ingots from component sales and describes external supply and xx.xx% internal superalloy sourcing, contradicting the inherited xx.xx% captive parameter.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
14. Acerinox - Results FY 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned US long-product expansion supports the relative conventional-long-material premise; investment is not recognized as sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately USD xx.xx of planned platform investment includes expansion of the long-products offering, informing the bars forecast premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace demand and planned long-product diversification support testing a relative mix shift without assuming flat-product contraction.

15. Haynes International - HAYNES 282
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Powder is offered alongside conventional forms for HAYNES xx.xx supporting nonexclusive form classification, not an observed sales allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
16. CMA - Anticipated Acquisition of Haynes International by Acerinox: Full Text Decision
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct customer evidence in paragraphs xx.xx-xx.xx supports separate flat/long purchasing pools; no published market-share table is used.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Shape-specific purchasing supports a distinct long-stock allocation model without proving a separate competitive market for billet.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.

17. Haynes International - HAYNES 230
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
18. Carpenter Technology - Advanced Materials for Aerospace Motor & Engines
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))
19. Elementum 3D - Metal Alloy Additive Manufacturing Colorado
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed. ([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed. ([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))
20. NASA - NASA-Developed Printable Metal Can Take the Heat
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake. ([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake. ([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

21. Carpenter Technology - Lighter, Faster, Stronger Metallurgy for Defense, July 2025

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

22. Special Metals - Aerospace

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight.
([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight.
([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy xx.xx; no sales weight is disclosed.
([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy X-xx.xx; no current sales quantity is disclosed.
([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Waspaloy; no sales weight is disclosed.
([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

23. Boeing - BDS Terms and Conditions Guide, D607 Material Substitution Prohibition, November 15, 2013
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: D607 prohibits unauthorized material substitutions while recognizing specified alternatives. It constrains assumptions about frictionless cross-class substitution, without quantifying adoption delays. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization requirements qualify assumptions about precipitation-family substitution opportunities; the clause does not prove future purchases or a class-growth premium. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause prohibits unauthorized substitutions where contractually applicable. It constrains the adoption interpretation but does not establish approval prevalence or a numerical adoption rate. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific material authorization is a counterweight to treating a named offering as immediately substitutable production material. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization limits interpretation of the assumed adoption multiplier; it does not directly establish powder sales. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))

24. Precision Castparts Corp. - Fiscal 2015 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
25. NASA - Chapter 2: Aerospace Materials Characteristics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

26. ESA - ESA Space Environment Report 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
27. NASA and Superalloys: A Customer, a Participant, and a Referee
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
28. VDM Metals - Alloys for the Aerospace Industry
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
29. Carpenter Technology - Business Segments
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))

30. Howmet Aerospace - 2025 Annual Report, Letter to Shareholders

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% combined aerospace and gas-turbine spares revenue constrains the distinction between initial-production and spare-component activity; material and destination adjustments remain modeled. ([howmet.com](https://www.howmet.com/annualreport/))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed combined spares proportion supplies the replacement proxy; approximately xx.xx% commercial aerospace engine-spares growth is historical counterevidence against assuming weak aftermarket activity. ([howmet.com](https://www.howmet.com/annualreport/))

31. GE Aerospace - 2025 Form 10-K

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment and services costs provide commercial budget anchors for the common material-value denominator; assumed eligible-material fractions prevent full equipment or service value from entering the allocation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Services include spare parts and maintenance activity, supporting an explicit new-article versus restoration attribution rather than equating services revenue with replacement-material purchases. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported USD xx.xx services cost anchors the restoration-material bridge; the restoration allocation and direct eligible-material fraction are assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Total funded R&D of USD xx.xx supplies a development-budget proxy, not observed nickel-material purchasing; only an assumed eligible-material fraction is used. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.

32. Rolls-Royce Holdings Plc - 2025 Full Year Results

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2028 shop-visit target is below the reported 2025 total despite prospective fleet growth, qualifying any automatic conversion of fleet expansion into proportionate maintenance-material purchasing.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The divergence between 2025 engine deliveries and shop visits independently challenges a uniform new-engine-led material forecast; no service revenue is included in the numerator.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Observed engine-delivery and shop-visit activity supports separate new-program and replacement-demand assumptions, not a proportional material-purchase conversion.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

33. UKRI - Accelerating Manufacturing Readiness level of ABD-1000AM for AM of high temperature aerospace components (AMRAM1000)
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The Alloyed-led project has xx.xx of funding and an April 2025-October 2026 funded period. This independently establishes bounded development activity, not annual material sales or recurring production purchases. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
34. Safran - FY 2025 Results and Investor Update, February 13, 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))

35. Airbus - Full-Year 2025 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 deliveries by aircraft family provide the starting activity comparison for the initial-production forecast; aircraft delivery value is not included in the material numerator. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx% decline in 2025 self-financed R&D is counterevidence to uniform development-budget acceleration and supports a restrained, explicitly assumed development-purchasing scenario. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.

36. Airbus - Half-Year 2026 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 update retained the A320-family, A350 and other production-rate targets, providing a dated commercial constraint on the initial-production activity scenario rather than proof of future material orders. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: First-half 2026 self-financed R&D of EUR xx.xx versus EUR xx.xx provides a modest-growth countercheck for the assumed development-project activity path; the budget is not material-market revenue. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))

37. RTX Corporation - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

38. Federal Reserve Bank of St. Louis - Annual USD/GBP Exchange Rate, AEXUSUK
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
39. L3Harris Technologies, Inc. - Fiscal 2025 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
40. FAA Aerospace Forecast Fiscal Years 2025-2045 - Commercial Space
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated official low/high scenarios provide FY2032 licensed launch/reentry activity bounds. Their U.S.-licensed scope and treatment of reusable vehicles prevent direct conversion into Global material revenue. ([faa.gov](https://www.faa.gov/data_research/aviation/aerospace_forecasts/2025-commercial-space.pdf))
41. ICAO - Convention on International Civil Aviation, Ninth Edition
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))

42. DFARS 252.225-7009 - Restriction on Acquisition of Certain Articles Containing Specialty Metals
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
43. Aubert & Duval - Space Industry Metallurgical Solutions
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
44. Aubert & Duval - Metallurgical Solutions for the Defense Industry, June 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
45. Berkshire Hathaway Inc. - 2025 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.

46. Lufthansa Group Annual Report 2025 - MRO business segment
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
47. Oliver Wyman - Global Fleet And MRO Market Forecast 2026-2036: Key Trends
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
48. German Aerospace Center (DLR) - Financing
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
49. Federal Aviation Administration - Parts Manufacturer Approval (PMA): Design Approval
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.

50. Rolled Alloys - E-Services Stocking Programs
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
51. Boeing BDS Terms and Conditions Guide - D604 Raw Material Risk Mitigation
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
52. Carpenter Technology Corporation - Second Quarter Fiscal 2026 Earnings Call Presentation, January 29, 2026
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation distinguishes specialized non-LTA business from a conventional spot market, countering automatic classification of transactional sales as stock.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Three additional aerospace LTAs and xx.xx% sequential commercial-aerospace bookings growth inform the reservation hypothesis, but do not measure its modeled magnitude.
53. Precision Castparts Corp. - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.

54. Howmet Aerospace - United States Locations
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.

55. ATI Inc. - 2024 Annual Report
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New sales commitments through 2040, including amounts expected during the remainder of the decade and predominantly involving jet-engine nickel alloys, inform the direct-program forecast premise without being counted as realized sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% of fiscal-2024 plate volume went to independent service centers, providing a historical comparison that cautions against assuming generalized intermediary displacement.

56. Alloyed - About
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.

57. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 aerospace realization and revenue provide the common monetary calibration for this modeled grade; neither is a grade-specific sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace material realization supplies a price-scale input, with modeled year and product-mix adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization calibrates the assumed blended material price, not this grade's observed revenue. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace realization provides a shared monetary comparison for the assumed grade price. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported eight-to-ten-year aerospace application-introduction periods constrain interpretation of the seven-year adoption forecast. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace application-introduction periods provide an adoption-delay counterweight, not a forecast sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
58. European Commission CORDIS - Welding Metallurgy and Cracking in Superalloys: Reporting
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical all-sector tonnage discussion is only a dominance cross-check; it cannot establish current aerospace monetary share. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies 718Plus separately from ordinary xx.xx supporting identity separation without supplying a current sales weight. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
59. Special Metals - Alloy Surcharge Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: August-October 2026 grade surcharges provide a differentiated cost-exposure check, not full invoice prices or observed 2032 prices. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx surcharge sequence independently qualifies a uniform price assumption; it is not substituted for a material selling price. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The grade-specific surcharge listing is a commercial cost comparison, not an observed Global grade realization. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))

60. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current-and-past supplier identity mapping only; not proof of 2025 aerospace sales or the modeled volume. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: CMSX-xx.xx is separately identified; the material-value weight remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current sales are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713C is listed separately from IN-713LC; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713LC is listed separately from IN-713C; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx identity mapping only; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-738LC is separately identified; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current aerospace tonnes are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx appears in a current-and-past identification list; this does not establish recurring aerospace production sales. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MAR-M xx.xx is identified separately from CM247LC; monetary weights remain modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PWA xx.xx is separately identified; no attributable sales value is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; current commercial scale remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; no current grade-specific material sales are disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Udimet xx.xx appears in the supplier's current-and-past identities; aerospace attribution is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

61. GE Aerospace - Safety First: A Retiring GE Aerospace Materials Engineer Made Protecting Lives His Mission
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
62. Aubert & Duval - AD730: Ni-Based Superalloy for High Temperature Applications
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
63. University of Portsmouth - Improved Creep-Fatigue-Oxidation Resistance in Gas Turbine Disc Materials: REF Impact Case Study
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))

64. Influence of Long Term Exposure in Air on Microstructure, Surface Stability and Mechanical Properties of UDIMET 720LI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The aerospace-industry publication distinguishes conventional Udimet xx.xx from its 720Li derivative; it does not establish a current monetary allocation. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The publication independently supports the 720Li identity and aircraft-engine-disc category, without supplying current sales. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

65. NASA Contractor Report 174639 - Literature Survey on Oxidations and Fatigue Lives at Elevated Temperatures

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical institutional material identification is a legacy-category anchor only; it does not demonstrate current aerospace material sales. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

66. America Makes - 5566.002 Proliferation of Nickel Superalloy Material Datasets for Powder Bed Fusion Additive Manufacturing

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))

67. GE Aerospace - Fourth Quarter 2025 Earnings Presentation

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 commercial-engine delivery growth supplies a near-term demand cross-check, not a grade-specific purchasing or seven-year growth observation. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aggregate commercial and defense delivery growth constrains the commercial-demand scenario without establishing this grade's attributable consumption. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported defense-engine delivery growth is a demand-exposure check only; the PWA xx.xx activity factor remains assumed. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

16.3. Asia-Pacific

Table 280. Asia-Pacific Nickel-Based Superalloys for Aerospace Market, by Country growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Indonesia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Malaysia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Philippines	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Singapore	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Taiwan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Thailand	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Unallocated / remaining scope	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 281. Asia-Pacific Nickel-Based Superalloys for Aerospace Market Size, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Indonesia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Malaysia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Philippines	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Singapore	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Taiwan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Thailand	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 282. Asia-Pacific Nickel-Based Superalloys for Aerospace Market Size, by Product Form, 2017-2040 (USD Million)

Product Form	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Bars, Rods and Profiles	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Billets and Forging Stock	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ingots	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Plate, Sheet, Strip and Foil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Powder	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Tubes and Pipes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Wire	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 283. Asia-Pacific Nickel-Based Superalloys for Aerospace Market Size, by Strengthening Class, 2017-2040 (USD Million)

Strengthening Class	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Dispersion-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Precipitation-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Solid-Solution-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 284. Asia-Pacific Nickel-Based Superalloys for Aerospace Market Size, by Component Application, 2017-2040 (USD Million)

Component Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Breathing Propulsion & Auxiliary Power	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Systems & Equipment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rocket & Spacecraft Propulsion	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Vehicle Structures & Thermal Protection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 285. Asia-Pacific Nickel-Based Superalloys for Aerospace Market Size, by Air-Breathing Propulsion & Auxiliary Power, 2017-2040 (USD Million)

Air-Breathing Propulsion & Auxiliary Power	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combustion & Exhaust Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Compressor Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine Structures & Auxiliary Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Blades & Vanes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Disks & Rotor Hardware	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 286. Asia-Pacific Nickel-Based Superalloys for Aerospace Market Size, by Demand Stage, 2017-2040 (USD Million)

Demand Stage	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Initial Equipment Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Repair, Overhaul & Refurbishment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Replacement & Retrofit Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research, Development & Qualification	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 287. Asia-Pacific Nickel-Based Superalloys for Aerospace Market Size, by Aerospace End Market, 2017-2040 (USD Million)

Aerospace End Market	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Civil & Nonmilitary State Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Guided Missile Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Military Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Space Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 288. Asia-Pacific Nickel-Based Superalloys for Aerospace Market Size, by Buyer Function, 2017-2040 (USD Million)

Buyer Function	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Aerospace Vehicle Manufacturers & Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Component & Subassembly Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine & Propulsion-System Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Maintenance, Repair & Overhaul Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Development Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 289. Asia-Pacific Nickel-Based Superalloys for Aerospace Market Size, by Fulfillment Model, 2017-2040 (USD Million)

Fulfillment Model	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Order-Dedicated Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stock Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 290. Asia-Pacific Nickel-Based Superalloys for Aerospace Market Size, by Supply Channel, 2017-2040 (USD Million)

Supply Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Captive Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent Intermediary Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Producer-Direct Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 291. Asia-Pacific Nickel-Based Superalloys for Aerospace Market Size, by Alloy Grade, 2017-2040 (USD Million)

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ABD-1000AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
ABD-900AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
AD730	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy 718Plus	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy X-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CM247LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CMSX-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hastelloy X	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713C	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 291 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
IN-713LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-738LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
MAR-M xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic 80A	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene 88DT	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
RR1000	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet 720Li	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Waspaloy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. ATI Inc. - 2025 Form 10-K

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Asian destination sales provide an independent broad-scope geographic check.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC's reported financial/product-category inputs and listed ingot offering constrain the eligible material envelope; the ingot allocation remains assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: AA&S sales of USD xx.xx and its xx.xx% nickel-based/specialty-alloy category anchor the separately adjusted rolled-material envelope.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial jet-engine revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025, supporting purchasing recovery but

2. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
3. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Narrow-strip supply supports a limited flat-product allocation within the modeled eligible Carpenter envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire is a disclosed supplied form; its eligible monetary weight remains modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.

4. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical xx.xx% slab/bar/billet revenue category constrains the long-stock proxy; its eligible billet split is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported combined stock category provides a proxy anchor, not a separately disclosed bar revenue share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 flat products represented approximately xx.xx% of net product revenue; extrapolation to the eligible Acerinox envelope is modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 wire represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 tubulars represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical product revenue, channel mix and backlog conversion anchor the modeled stock value weight, with explicit scope adjustments.

5. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Casting-alloy activities support an ingot-material equivalent rather than attributing full engine-component revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed metal/billet activities support retaining a forging-stock allocation; the assumed xx.xx% weight is not reported.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported 2025 sales of USD xx.xx and Engine Products aerospace revenues of USD xx.xx commercial and USD xx.xx defense establish the component-cohort scale; USD xx.xx gas-turbine revenue is excluded through an explicit attribution model. These are not material-market revenues. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The segment/end-market revenue table supplies the aerospace and gas-turbine boundaries needed to bridge combined spares activity into an aerospace replacement-material proxy. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial aerospace represented xx.xx% of 2025 company sales, supplying an independent downstream mix comparison rather than a nickel-material allocation weight. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense aerospace represented xx.xx% of 2025 company sales; the paired commercial/defense comparison tests the aviation model while retaining component and material-scope differences. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.

6. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: GE describes repaired/serviceable-part reuse, supporting a counterforce to converting aftermarket activity directly into newly supplied material purchases. Its reported approximately xx.xx% strategic-nickel revert content is not deducted from the terminal-material market. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Commercial repair and component reuse support retaining uncertainty around replacement-related combustion material purchases. The selected procurement-intensity offset remains an assumption, not a measured avoided-purchase percentage. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
7. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
8. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
9. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Component-trade exposure qualifies a direct conversion of maintenance-hub activity into raw-material demand.

10. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal 2024-2025 Asia-Pacific decline is counterevidence to automatic regional growth; it qualifies the forecast assumption.
11. Special Metals - Tech Center
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised ingot supply establishes a PCC material-form crosswalk, not its sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised billet supply supports the forging-stock category mapping within the inherited PCC envelope.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised bar supply supports classification only; the monetary coefficient is an assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Plate, sheet and strip offerings support a distinct flat-product allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire availability supports the material-form crosswalk without establishing revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Tubing availability supports the material-form crosswalk without establishing revenue.
12. DPC Holdings Limited - Registration Statement with 2025 Financial Statements
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing separates ingots from component sales and describes external supply and xx.xx% internal superalloy sourcing, contradicting the inherited xx.xx% captive parameter.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.

13. Acerinox - Results FY 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned US long-product expansion supports the relative conventional-long-material premise; investment is not recognized as sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately USD xx.xx of planned platform investment includes expansion of the long-products offering, informing the bars forecast premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace demand and planned long-product diversification support testing a relative mix shift without assuming flat-product contraction.
14. Haynes International - HAYNES 282
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Powder is offered alongside conventional forms for HAYNES xx.xx supporting nonexclusive form classification, not an observed sales allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification.
      ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification.
      ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))

15. CMA - Anticipated Acquisition of Haynes International by Acerinox: Full Text Decision
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct customer evidence in paragraphs xx.xx-xx.xx supports separate flat/long purchasing pools; no published market-share table is used.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Shape-specific purchasing supports a distinct long-stock allocation model without proving a separate competitive market for billet.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
16. Haynes International - HAYNES 230
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))

17. Carpenter Technology - Advanced Materials for Aerospace Motor & Engines

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation.
([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation.
([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))

18. Elementum 3D - Metal Alloy Additive Manufacturing Colorado

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed.
([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed.
([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))

19. NASA - NASA-Developed Printable Metal Can Take the Heat

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake.
([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake.
([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

20. Carpenter Technology - Lighter, Faster, Stronger Metallurgy for Defense, July 2025

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

21. Special Metals - Aerospace
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy xx.xx; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy X-xx.xx; no current sales quantity is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Waspaloy; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

22. Boeing - BDS Terms and Conditions Guide, D607 Material Substitution Prohibition, November 15, 2013
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: D607 prohibits unauthorized material substitutions while recognizing specified alternatives. It constrains assumptions about frictionless cross-class substitution, without quantifying adoption delays. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization requirements qualify assumptions about precipitation-family substitution opportunities; the clause does not prove future purchases or a class-growth premium. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause prohibits unauthorized substitutions where contractually applicable. It constrains the adoption interpretation but does not establish approval prevalence or a numerical adoption rate. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific material authorization is a counterweight to treating a named offering as immediately substitutable production material. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization limits interpretation of the assumed adoption multiplier; it does not directly establish powder sales. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))

23. Precision Castparts Corp. - Fiscal 2015 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.

24. NASA - Chapter 2: Aerospace Materials Characteristics

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

25. ESA - ESA Space Environment Report 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
26. NASA and Superalloys: A Customer, a Participant, and a Referee
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
27. VDM Metals - Alloys for the Aerospace Industry
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
28. Carpenter Technology - Business Segments
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))

29. Howmet Aerospace - 2025 Annual Report, Letter to Shareholders

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% combined aerospace and gas-turbine spares revenue constrains the distinction between initial-production and spare-component activity; material and destination adjustments remain modeled. ([howmet.com](https://www.howmet.com/annualreport/))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed combined spares proportion supplies the replacement proxy; approximately xx.xx% commercial aerospace engine-spares growth is historical counterevidence against assuming weak aftermarket activity. ([howmet.com](https://www.howmet.com/annualreport/))

30. GE Aerospace - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment and services costs provide commercial budget anchors for the common material-value denominator; assumed eligible-material fractions prevent full equipment or service value from entering the allocation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Services include spare parts and maintenance activity, supporting an explicit new-article versus restoration attribution rather than equating services revenue with replacement-material purchases. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported USD xx.xx services cost anchors the restoration-material bridge; the restoration allocation and direct eligible-material fraction are assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Total funded R&D of USD xx.xx supplies a development-budget proxy, not observed nickel-material purchasing; only an assumed eligible-material fraction is used. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.

31. Rolls-Royce Holdings Plc - 2025 Full Year Results

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2028 shop-visit target is below the reported 2025 total despite prospective fleet growth, qualifying any automatic conversion of fleet expansion into proportionate maintenance-material purchasing.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The divergence between 2025 engine deliveries and shop visits independently challenges a uniform new-engine-led material forecast; no service revenue is included in the numerator.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Observed engine-delivery and shop-visit activity supports separate new-program and replacement-demand assumptions, not a proportional material-purchase conversion.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

32. UKRI - Accelerating Manufacturing Readiness level of ABD-1000AM for AM of high temperature aerospace components (AMRAM1000)
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The Alloyed-led project has xx.xx of funding and an April 2025-October 2026 funded period. This independently establishes bounded development activity, not annual material sales or recurring production purchases. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
33. Safran - FY 2025 Results and Investor Update, February 13, 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))

34. Airbus - Full-Year 2025 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 deliveries by aircraft family provide the starting activity comparison for the initial-production forecast; aircraft delivery value is not included in the material numerator. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx% decline in 2025 self-financed R&D is counterevidence to uniform development-budget acceleration and supports a restrained, explicitly assumed development-purchasing scenario. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.

35. Airbus - Half-Year 2026 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 update retained the A320-family, A350 and other production-rate targets, providing a dated commercial constraint on the initial-production activity scenario rather than proof of future material orders. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: First-half 2026 self-financed R&D of EUR xx.xx versus EUR xx.xx provides a modest-growth countercheck for the assumed development-project activity path; the budget is not material-market revenue. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))

36. RTX Corporation - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

37. Federal Reserve Bank of St. Louis - Annual USD/GBP Exchange Rate, AEXUSUK
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
38. L3Harris Technologies, Inc. - Fiscal 2025 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
39. FAA Aerospace Forecast Fiscal Years 2025-2045 - Commercial Space
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated official low/high scenarios provide FY2032 licensed launch/reentry activity bounds. Their U.S.-licensed scope and treatment of reusable vehicles prevent direct conversion into Global material revenue. ([faa.gov](https://www.faa.gov/data_research/aviation/aerospace_forecasts/2025-commercial-space.pdf))
40. ICAO - Convention on International Civil Aviation, Ninth Edition
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))

41. DFARS 252.225-7009 - Restriction on Acquisition of Certain Articles Containing Specialty Metals
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
42. Aubert & Duval - Space Industry Metallurgical Solutions
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
43. Aubert & Duval - Metallurgical Solutions for the Defense Industry, June 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
44. Berkshire Hathaway Inc. - 2025 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.

45. Lufthansa Group Annual Report 2025 - MRO business segment
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
46. Oliver Wyman - Global Fleet And MRO Market Forecast 2026-2036: Key Trends
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
47. German Aerospace Center (DLR) - Financing
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
48. Federal Aviation Administration - Parts Manufacturer Approval (PMA): Design Approval
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.

49. Rolled Alloys - E-Services Stocking Programs
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
50. Boeing BDS Terms and Conditions Guide - D604 Raw Material Risk Mitigation
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
51. Carpenter Technology Corporation - Second Quarter Fiscal 2026 Earnings Call Presentation, January 29, 2026
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation distinguishes specialized non-LTA business from a conventional spot market, countering automatic classification of transactional sales as stock.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Three additional aerospace LTAs and xx.xx% sequential commercial-aerospace bookings growth inform the reservation hypothesis, but do not measure its modeled magnitude.
52. Precision Castparts Corp. - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.

53. Howmet Aerospace - United States Locations
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
54. ATI Inc. - 2024 Annual Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New sales commitments through 2040, including amounts expected during the remainder of the decade and predominantly involving jet-engine nickel alloys, inform the direct-program forecast premise without being counted as realized sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% of fiscal-2024 plate volume went to independent service centers, providing a historical comparison that cautions against assuming generalized intermediary displacement.
55. Alloyed - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.

56. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 aerospace realization and revenue provide the common monetary calibration for this modeled grade; neither is a grade-specific sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace material realization supplies a price-scale input, with modeled year and product-mix adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization calibrates the assumed blended material price, not this grade's observed revenue. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace realization provides a shared monetary comparison for the assumed grade price. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported eight-to-ten-year aerospace application-introduction periods constrain interpretation of the seven-year adoption forecast. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace application-introduction periods provide an adoption-delay counterweight, not a forecast sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
57. European Commission CORDIS - Welding Metallurgy and Cracking in Superalloys: Reporting
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical all-sector tonnage discussion is only a dominance cross-check; it cannot establish current aerospace monetary share. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies 718Plus separately from ordinary xx.xx supporting identity separation without supplying a current sales weight. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
58. Special Metals - Alloy Surcharge Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: August-October 2026 grade surcharges provide a differentiated cost-exposure check, not full invoice prices or observed 2032 prices. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx surcharge sequence independently qualifies a uniform price assumption; it is not substituted for a material selling price. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The grade-specific surcharge listing is a commercial cost comparison, not an observed Global grade realization. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))

59. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current-and-past supplier identity mapping only; not proof of 2025 aerospace sales or the modeled volume. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: CMSX-xx.xx is separately identified; the material-value weight remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current sales are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713C is listed separately from IN-713LC; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713LC is listed separately from IN-713C; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx identity mapping only; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-738LC is separately identified; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current aerospace tonnes are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx appears in a current-and-past identification list; this does not establish recurring aerospace production sales. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: MAR-M xx.xx is identified separately from CM247LC; monetary weights remain modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PWA xx.xx is separately identified; no attributable sales value is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; current commercial scale remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; no current grade-specific material sales are disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Udimet xx.xx appears in the supplier's current-and-past identities; aerospace attribution is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

60. GE Aerospace - Safety First: A Retiring GE Aerospace Materials Engineer Made Protecting Lives His Mission
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
61. Aubert & Duval - AD730: Ni-Based Superalloy for High Temperature Applications
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
62. University of Portsmouth - Improved Creep-Fatigue-Oxidation Resistance in Gas Turbine Disc Materials: REF Impact Case Study
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))

63. Influence of Long Term Exposure in Air on Microstructure, Surface Stability and Mechanical Properties of UDIMET 720LI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The aerospace-industry publication distinguishes conventional Udimet xx.xx from its 720Li derivative; it does not establish a current monetary allocation. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The publication independently supports the 720Li identity and aircraft-engine-disc category, without supplying current sales. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

64. NASA Contractor Report 174639 - Literature Survey on Oxidations and Fatigue Lives at Elevated Temperatures

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical institutional material identification is a legacy-category anchor only; it does not demonstrate current aerospace material sales. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

65. America Makes - 5566.002 Proliferation of Nickel Superalloy Material Datasets for Powder Bed Fusion Additive Manufacturing

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))

66. GE Aerospace - Fourth Quarter 2025 Earnings Presentation

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 commercial-engine delivery growth supplies a near-term demand cross-check, not a grade-specific purchasing or seven-year growth observation. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aggregate commercial and defense delivery growth constrains the commercial-demand scenario without establishing this grade's attributable consumption. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported defense-engine delivery growth is a demand-exposure check only; the PWA xx.xx activity factor remains assumed. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

16.4. Middle East

Table 292. Middle East Nickel-Based Superalloys for Aerospace Market, by Country growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Israel	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Qatar	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Saudi Arabia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turkey	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Unallocated / remaining scope	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Arab Emirates	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 293. Middle East Nickel-Based Superalloys for Aerospace Market Size, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Israel	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Qatar	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Saudi Arabia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turkey	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Arab Emirates	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 294. Middle East Nickel-Based Superalloys for Aerospace Market Size, by Product Form, 2017-2040 (USD Million)

Product Form	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Bars, Rods and Profiles	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Billets and Forging Stock	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ingots	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Plate, Sheet, Strip and Foil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Powder	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Tubes and Pipes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Wire	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 295. Middle East Nickel-Based Superalloys for Aerospace Market Size, by Strengthening Class, 2017-2040 (USD Million)

Strengthening Class	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Dispersion-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Precipitation-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Solid-Solution-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 296. Middle East Nickel-Based Superalloys for Aerospace Market Size, by Component Application, 2017-2040 (USD Million)

Component Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Breathing Propulsion & Auxiliary Power	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Systems & Equipment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rocket & Spacecraft Propulsion	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Vehicle Structures & Thermal Protection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 297. Middle East Nickel-Based Superalloys for Aerospace Market Size, by Air-Breathing Propulsion & Auxiliary Power, 2017-2040 (USD Million)

Air-Breathing Propulsion & Auxiliary Power	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combustion & Exhaust Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Compressor Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine Structures & Auxiliary Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Blades & Vanes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Disks & Rotor Hardware	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 298. Middle East Nickel-Based Superalloys for Aerospace Market Size, by Demand Stage, 2017-2040 (USD Million)

Demand Stage	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Initial Equipment Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Repair, Overhaul & Refurbishment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Replacement & Retrofit Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research, Development & Qualification	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 299. Middle East Nickel-Based Superalloys for Aerospace Market Size, by Aerospace End Market, 2017-2040 (USD Million)

Aerospace End Market	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Civil & Nonmilitary State Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Guided Missile Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Military Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Space Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 300. Middle East Nickel-Based Superalloys for Aerospace Market Size, by Buyer Function, 2017-2040 (USD Million)

Buyer Function	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Aerospace Vehicle Manufacturers & Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Component & Subassembly Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine & Propulsion-System Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Maintenance, Repair & Overhaul Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Development Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 301. Middle East Nickel-Based Superalloys for Aerospace Market Size, by Fulfillment Model, 2017-2040 (USD Million)

Fulfillment Model	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Order-Dedicated Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stock Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 302. Middle East Nickel-Based Superalloys for Aerospace Market Size, by Supply Channel, 2017-2040 (USD Million)

Supply Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Captive Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent Intermediary Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Producer-Direct Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 303. Middle East Nickel-Based Superalloys for Aerospace Market Size, by Alloy Grade, 2017-2040 (USD Million)

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ABD-1000AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
ABD-900AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 303 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
AD730	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy 718Plus	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy X-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CM247LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CMSX-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hastelloy X	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713C	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-738LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
MAR-M xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic 80A	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene 88DT	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 303 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
RR1000	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet 720Li	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Waspaloy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. ATI Inc. - 2025 Form 10-K

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC's reported financial/product-category inputs and listed ingot offering constrain the eligible material envelope; the ingot allocation remains assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: AA&S sales of USD xx.xx and its xx.xx% nickel-based/specialty-alloy category anchor the separately adjusted rolled-material envelope.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial jet-engine revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025, supporting purchasing recovery but not identifying price growth or a 2032 material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))

2. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
3. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Narrow-strip supply supports a limited flat-product allocation within the modeled eligible Carpenter envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire is a disclosed supplied form; its eligible monetary weight remains modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.

4. Haynes International, Inc. - 2023 Form 10-K

- Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
- Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
- Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
- Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
- Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical xx.xx% slab/bar/billet revenue category constrains the long-stock proxy; its eligible billet split is assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported combined stock category provides a proxy anchor, not a separately disclosed bar revenue share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 flat products represented approximately xx.xx% of net product revenue; extrapolation to the eligible Acerinox envelope is modeled.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 wire represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 tubulars represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical product revenue, channel mix and backlog conversion anchor the modeled stock value weight, with explicit scope adjustments.

5. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Casting-alloy activities support an ingot-material equivalent rather than attributing full engine-component revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed metal/billet activities support retaining a forging-stock allocation; the assumed xx.xx% weight is not reported.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported 2025 sales of USD xx.xx and Engine Products aerospace revenues of USD xx.xx commercial and USD xx.xx defense establish the component-cohort scale; USD xx.xx gas-turbine revenue is excluded through an explicit attribution model. These are not material-market revenues. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The segment/end-market revenue table supplies the aerospace and gas-turbine boundaries needed to bridge combined spares activity into an aerospace replacement-material proxy. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial aerospace represented xx.xx% of 2025 company sales, supplying an independent downstream mix comparison rather than a nickel-material allocation weight. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense aerospace represented xx.xx% of 2025 company sales; the paired commercial/defense comparison tests the aviation model while retaining component and material-scope differences. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.

6. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: GE describes repaired/serviceable-part reuse, supporting a counterforce to converting aftermarket activity directly into newly supplied material purchases. Its reported approximately xx.xx% strategic-nickel revert content is not deducted from the terminal-material market. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Commercial repair and component reuse support retaining uncertainty around replacement-related combustion material purchases. The selected procurement-intensity offset remains an assumption, not a measured avoided-purchase percentage. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
7. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
8. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
9. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2023
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Older bar-import input with explicit temporal and relevance bridge.
10. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2023
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2023 flat-product input supplements the older bar primitive.

11. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Completed shop visits establish existing service activity; announced expansion constrains timing but does not establish alloy procurement or forecast revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Completed shop visits establish existing service activity; announced expansion constrains timing but does not establish alloy procurement or forecast revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Agreement-specific milestones qualify assumed regional material-demand growth.
12. TEI - TEI Provides MRO Services to International Fighter Aircraft, January 30, 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Maintenance performed in Turkey for overseas operators supports service-location attribution rather than airline-country allocation; material intensity remains assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Maintenance performed in Turkey for overseas operators supports service-location attribution rather than airline-country allocation; material intensity remains assumed.
13. Special Metals - Tech Center
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised ingot supply establishes a PCC material-form crosswalk, not its sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised billet supply supports the forging-stock category mapping within the inherited PCC envelope.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised bar supply supports classification only; the monetary coefficient is an assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Plate, sheet and strip offerings support a distinct flat-product allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire availability supports the material-form crosswalk without establishing revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Tubing availability supports the material-form crosswalk without establishing revenue.

14. DPC Holdings Limited - Registration Statement with 2025 Financial Statements
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing separates ingots from component sales and describes external supply and xx.xx% internal superalloy sourcing, contradicting the inherited xx.xx% captive parameter.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
15. Acerinox - Results FY 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned US long-product expansion supports the relative conventional-long-material premise; investment is not recognized as sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately USD xx.xx of planned platform investment includes expansion of the long-products offering, informing the bars forecast premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace demand and planned long-product diversification support testing a relative mix shift without assuming flat-product contraction.
16. Haynes International - HAYNES 282
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Powder is offered alongside conventional forms for HAYNES xx.xx supporting nonexclusive form classification, not an observed sales allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))

17. CMA - Anticipated Acquisition of Haynes International by Acerinox: Full Text Decision
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct customer evidence in paragraphs xx.xx-xx.xx supports separate flat/long purchasing pools; no published market-share table is used.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Shape-specific purchasing supports a distinct long-stock allocation model without proving a separate competitive market for billet.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
18. Haynes International - HAYNES 230
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))

19. Carpenter Technology - Advanced Materials for Aerospace Motor & Engines

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation.
([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation.
([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))

20. Elementum 3D - Metal Alloy Additive Manufacturing Colorado

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed.
([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed.
([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))

21. NASA - NASA-Developed Printable Metal Can Take the Heat

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake.
([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake.
([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

22. Carpenter Technology - Lighter, Faster, Stronger Metallurgy for Defense, July 2025

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

23. Special Metals - Aerospace
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy xx.xx; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy X-xx.xx; no current sales quantity is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Waspaloy; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

24. Boeing - BDS Terms and Conditions Guide, D607 Material Substitution Prohibition, November 15, 2013
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: D607 prohibits unauthorized material substitutions while recognizing specified alternatives. It constrains assumptions about frictionless cross-class substitution, without quantifying adoption delays. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization requirements qualify assumptions about precipitation-family substitution opportunities; the clause does not prove future purchases or a class-growth premium. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause prohibits unauthorized substitutions where contractually applicable. It constrains the adoption interpretation but does not establish approval prevalence or a numerical adoption rate. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific material authorization is a counterweight to treating a named offering as immediately substitutable production material. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization limits interpretation of the assumed adoption multiplier; it does not directly establish powder sales. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))

25. Precision Castparts Corp. - Fiscal 2015 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.

26. NASA - Chapter 2: Aerospace Materials Characteristics

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

27. ESA - ESA Space Environment Report 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
28. NASA and Superalloys: A Customer, a Participant, and a Referee
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
29. VDM Metals - Alloys for the Aerospace Industry
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
30. Carpenter Technology - Business Segments
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))

31. Howmet Aerospace - 2025 Annual Report, Letter to Shareholders

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% combined aerospace and gas-turbine spares revenue constrains the distinction between initial-production and spare-component activity; material and destination adjustments remain modeled. ([howmet.com](https://www.howmet.com/annualreport/))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed combined spares proportion supplies the replacement proxy; approximately xx.xx% commercial aerospace engine-spares growth is historical counterevidence against assuming weak aftermarket activity. ([howmet.com](https://www.howmet.com/annualreport/))

32. GE Aerospace - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment and services costs provide commercial budget anchors for the common material-value denominator; assumed eligible-material fractions prevent full equipment or service value from entering the allocation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Services include spare parts and maintenance activity, supporting an explicit new-article versus restoration attribution rather than equating services revenue with replacement-material purchases. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported USD xx.xx services cost anchors the restoration-material bridge; the restoration allocation and direct eligible-material fraction are assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Total funded R&D of USD xx.xx supplies a development-budget proxy, not observed nickel-material purchasing; only an assumed eligible-material fraction is used. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.

33. Rolls-Royce Holdings Plc - 2025 Full Year Results

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2028 shop-visit target is below the reported 2025 total despite prospective fleet growth, qualifying any automatic conversion of fleet expansion into proportionate maintenance-material purchasing.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The divergence between 2025 engine deliveries and shop visits independently challenges a uniform new-engine-led material forecast; no service revenue is included in the numerator.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Observed engine-delivery and shop-visit activity supports separate new-program and replacement-demand assumptions, not a proportional material-purchase conversion.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

34. UKRI - Accelerating Manufacturing Readiness level of ABD-1000AM for AM of high temperature aerospace components (AMRAM1000)
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The Alloyed-led project has xx.xx of funding and an April 2025-October 2026 funded period. This independently establishes bounded development activity, not annual material sales or recurring production purchases. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
35. Safran - FY 2025 Results and Investor Update, February 13, 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))

36. Airbus - Full-Year 2025 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 deliveries by aircraft family provide the starting activity comparison for the initial-production forecast; aircraft delivery value is not included in the material numerator. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx% decline in 2025 self-financed R&D is counterevidence to uniform development-budget acceleration and supports a restrained, explicitly assumed development-purchasing scenario. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.

37. Airbus - Half-Year 2026 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 update retained the A320-family, A350 and other production-rate targets, providing a dated commercial constraint on the initial-production activity scenario rather than proof of future material orders. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: First-half 2026 self-financed R&D of EUR xx.xx versus EUR xx.xx provides a modest-growth countercheck for the assumed development-project activity path; the budget is not material-market revenue. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))

38. RTX Corporation - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

39. Federal Reserve Bank of St. Louis - Annual USD/GBP Exchange Rate, AEXUSUK
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
40. L3Harris Technologies, Inc. - Fiscal 2025 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
41. FAA Aerospace Forecast Fiscal Years 2025-2045 - Commercial Space
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated official low/high scenarios provide FY2032 licensed launch/reentry activity bounds. Their U.S.-licensed scope and treatment of reusable vehicles prevent direct conversion into Global material revenue. ([faa.gov](https://www.faa.gov/data_research/aviation/aerospace_forecasts/2025-commercial-space.pdf))
42. ICAO - Convention on International Civil Aviation, Ninth Edition
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))

43. DFARS 252.225-7009 - Restriction on Acquisition of Certain Articles Containing Specialty Metals
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
44. Aubert & Duval - Space Industry Metallurgical Solutions
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
45. Aubert & Duval - Metallurgical Solutions for the Defense Industry, June 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
46. Berkshire Hathaway Inc. - 2025 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.

47. Lufthansa Group Annual Report 2025 - MRO business segment
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
48. Oliver Wyman - Global Fleet And MRO Market Forecast 2026-2036: Key Trends
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
49. German Aerospace Center (DLR) - Financing
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
50. Federal Aviation Administration - Parts Manufacturer Approval (PMA): Design Approval
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.

51. Rolled Alloys - E-Services Stocking Programs
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
52. Boeing BDS Terms and Conditions Guide - D604 Raw Material Risk Mitigation
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
53. Carpenter Technology Corporation - Second Quarter Fiscal 2026 Earnings Call Presentation, January 29, 2026
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation distinguishes specialized non-LTA business from a conventional spot market, countering automatic classification of transactional sales as stock.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Three additional aerospace LTAs and xx.xx% sequential commercial-aerospace bookings growth inform the reservation hypothesis, but do not measure its modeled magnitude.
54. Precision Castparts Corp. - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.

55. Howmet Aerospace - United States Locations
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
56. ATI Inc. - 2024 Annual Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New sales commitments through 2040, including amounts expected during the remainder of the decade and predominantly involving jet-engine nickel alloys, inform the direct-program forecast premise without being counted as realized sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% of fiscal-2024 plate volume went to independent service centers, providing a historical comparison that cautions against assuming generalized intermediary displacement.
57. Alloyed - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.

58. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 aerospace realization and revenue provide the common monetary calibration for this modeled grade; neither is a grade-specific sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace material realization supplies a price-scale input, with modeled year and product-mix adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization calibrates the assumed blended material price, not this grade's observed revenue. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace realization provides a shared monetary comparison for the assumed grade price. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported eight-to-ten-year aerospace application-introduction periods constrain interpretation of the seven-year adoption forecast. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace application-introduction periods provide an adoption-delay counterweight, not a forecast sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
59. European Commission CORDIS - Welding Metallurgy and Cracking in Superalloys: Reporting
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical all-sector tonnage discussion is only a dominance cross-check; it cannot establish current aerospace monetary share. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies 718Plus separately from ordinary xx.xx supporting identity separation without supplying a current sales weight. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
60. Special Metals - Alloy Surcharge Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: August-October 2026 grade surcharges provide a differentiated cost-exposure check, not full invoice prices or observed 2032 prices. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx surcharge sequence independently qualifies a uniform price assumption; it is not substituted for a material selling price. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The grade-specific surcharge listing is a commercial cost comparison, not an observed Global grade realization. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))

61. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current-and-past supplier identity mapping only; not proof of 2025 aerospace sales or the modeled volume. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: CMSX-xx.xx is separately identified; the material-value weight remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current sales are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713C is listed separately from IN-713LC; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713LC is listed separately from IN-713C; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx identity mapping only; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-738LC is separately identified; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current aerospace tonnes are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx appears in a current-and-past identification list; this does not establish recurring aerospace production sales. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: MAR-M xx.xx is identified separately from CM247LC; monetary weights remain modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PWA xx.xx is separately identified; no attributable sales value is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; current commercial scale remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; no current grade-specific material sales are disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Udimet xx.xx appears in the supplier's current-and-past identities; aerospace attribution is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

62. GE Aerospace - Safety First: A Retiring GE Aerospace Materials Engineer Made Protecting Lives His Mission
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
63. Aubert & Duval - AD730: Ni-Based Superalloy for High Temperature Applications
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
64. University of Portsmouth - Improved Creep-Fatigue-Oxidation Resistance in Gas Turbine Disc Materials: REF Impact Case Study
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))

65. Influence of Long Term Exposure in Air on Microstructure, Surface Stability and Mechanical Properties of UDIMET 720LI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The aerospace-industry publication distinguishes conventional Udimet xx.xx from its 720Li derivative; it does not establish a current monetary allocation. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The publication independently supports the 720Li identity and aircraft-engine-disc category, without supplying current sales. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

66. NASA Contractor Report 174639 - Literature Survey on Oxidations and Fatigue Lives at Elevated Temperatures

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical institutional material identification is a legacy-category anchor only; it does not demonstrate current aerospace material sales. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

67. America Makes - 5566.002 Proliferation of Nickel Superalloy Material Datasets for Powder Bed Fusion Additive Manufacturing

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))

68. GE Aerospace - Fourth Quarter 2025 Earnings Presentation

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 commercial-engine delivery growth supplies a near-term demand cross-check, not a grade-specific purchasing or seven-year growth observation. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aggregate commercial and defense delivery growth constrains the commercial-demand scenario without establishing this grade's attributable consumption. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported defense-engine delivery growth is a demand-exposure check only; the PWA xx.xx activity factor remains assumed. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

16.5. Latin America

Table 304. Latin America Nickel-Based Superalloys for Aerospace Market, by Country growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Argentina	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Chile	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Colombia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Peru	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Unallocated / remaining scope	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 305. Latin America Nickel-Based Superalloys for Aerospace Market Size, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Argentina	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Chile	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Colombia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Peru	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 306. Latin America Nickel-Based Superalloys for Aerospace Market Size, by Product Form, 2017-2040 (USD Million)

Product Form	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Bars, Rods and Profiles	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Billets and Forging Stock	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ingots	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Plate, Sheet, Strip and Foil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Powder	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Tubes and Pipes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Wire	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 307. Latin America Nickel-Based Superalloys for Aerospace Market Size, by Strengthening Class, 2017-2040 (USD Million)

Strengthening Class	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Dispersion-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Precipitation-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Solid-Solution-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 308. Latin America Nickel-Based Superalloys for Aerospace Market Size, by Component Application, 2017-2040 (USD Million)

Component Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Breathing Propulsion & Auxiliary Power	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Systems & Equipment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rocket & Spacecraft Propulsion	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Vehicle Structures & Thermal Protection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 309. Latin America Nickel-Based Superalloys for Aerospace Market Size, by Air-Breathing Propulsion & Auxiliary Power, 2017-2040 (USD Million)

Air-Breathing Propulsion & Auxiliary Power	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combustion & Exhaust Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Compressor Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine Structures & Auxiliary Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Blades & Vanes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Disks & Rotor Hardware	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 310. Latin America Nickel-Based Superalloys for Aerospace Market Size, by Demand Stage, 2017-2040 (USD Million)

Demand Stage	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Initial Equipment Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Repair, Overhaul & Refurbishment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Replacement & Retrofit Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research, Development & Qualification	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 311. Latin America Nickel-Based Superalloys for Aerospace Market Size, by Aerospace End Market, 2017-2040 (USD Million)

Aerospace End Market	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Civil & Nonmilitary State Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Guided Missile Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Military Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Space Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 312. Latin America Nickel-Based Superalloys for Aerospace Market Size, by Buyer Function, 2017-2040 (USD Million)

Buyer Function	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Aerospace Vehicle Manufacturers & Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Component & Subassembly Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine & Propulsion-System Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Maintenance, Repair & Overhaul Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Development Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 313. Latin America Nickel-Based Superalloys for Aerospace Market Size, by Fulfillment Model, 2017-2040 (USD Million)

Fulfillment Model	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Order-Dedicated Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stock Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 314. Latin America Nickel-Based Superalloys for Aerospace Market Size, by Supply Channel, 2017-2040 (USD Million)

Supply Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Captive Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent Intermediary Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Producer-Direct Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 315. Latin America Nickel-Based Superalloys for Aerospace Market Size, by Alloy Grade, 2017-2040 (USD Million)

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ABD-1000AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
ABD-900AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 315 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
AD730	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy 718Plus	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy X-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CM247LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CMSX-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hastelloy X	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713C	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-738LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
MAR-M xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic 80A	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene 88DT	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 315 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
RR1000	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet 720Li	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Waspaloy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. ATI Inc. - 2025 Form 10-K

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC's reported financial/product-category inputs and listed ingot offering constrain the eligible material envelope; the ingot allocation remains assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: AA&S sales of USD xx.xx and its xx.xx% nickel-based/specialty-alloy category anchor the separately adjusted rolled-material envelope.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial jet-engine revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025, supporting purchasing recovery but not identifying price growth or a 2032 material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))

2. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
3. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Narrow-strip supply supports a limited flat-product allocation within the modeled eligible Carpenter envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire is a disclosed supplied form; its eligible monetary weight remains modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.

4. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical xx.xx% slab/bar/billet revenue category constrains the long-stock proxy; its eligible billet split is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported combined stock category provides a proxy anchor, not a separately disclosed bar revenue share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 flat products represented approximately xx.xx% of net product revenue; extrapolation to the eligible Acerinox envelope is modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 wire represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 tubulars represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical product revenue, channel mix and backlog conversion anchor the modeled stock value weight, with explicit scope adjustments.

5. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Casting-alloy activities support an ingot-material equivalent rather than attributing full engine-component revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed metal/billet activities support retaining a forging-stock allocation; the assumed xx.xx% weight is not reported.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported 2025 sales of USD xx.xx and Engine Products aerospace revenues of USD xx.xx commercial and USD xx.xx defense establish the component-cohort scale; USD xx.xx gas-turbine revenue is excluded through an explicit attribution model. These are not material-market revenues. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The segment/end-market revenue table supplies the aerospace and gas-turbine boundaries needed to bridge combined spares activity into an aerospace replacement-material proxy. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial aerospace represented xx.xx% of 2025 company sales, supplying an independent downstream mix comparison rather than a nickel-material allocation weight. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense aerospace represented xx.xx% of 2025 company sales; the paired commercial/defense comparison tests the aviation model while retaining component and material-scope differences. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.

6. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: GE describes repaired/serviceable-part reuse, supporting a counterforce to converting aftermarket activity directly into newly supplied material purchases. Its reported approximately xx.xx% strategic-nickel revert content is not deducted from the terminal-material market. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Commercial repair and component reuse support retaining uncertainty around replacement-related combustion material purchases. The selected procurement-intensity offset remains an assumption, not a measured avoided-purchase percentage. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
7. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Material-trade input.
8. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
9. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

10. Special Metals - Tech Center
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised ingot supply establishes a PCC material-form crosswalk, not its sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised billet supply supports the forging-stock category mapping within the inherited PCC envelope.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised bar supply supports classification only; the monetary coefficient is an assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Plate, sheet and strip offerings support a distinct flat-product allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire availability supports the material-form crosswalk without establishing revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Tubing availability supports the material-form crosswalk without establishing revenue.
11. DPC Holdings Limited - Registration Statement with 2025 Financial Statements
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing separates ingots from component sales and describes external supply and xx.xx% internal superalloy sourcing, contradicting the inherited xx.xx% captive parameter.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
12. Acerinox - Results FY 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned US long-product expansion supports the relative conventional-long-material premise; investment is not recognized as sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately USD xx.xx of planned platform investment includes expansion of the long-products offering, informing the bars forecast premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace demand and planned long-product diversification support testing a relative mix shift without assuming flat-product contraction.

13. Haynes International - HAYNES 282
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Powder is offered alongside conventional forms for HAYNES xx.xx supporting nonexclusive form classification, not an observed sales allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
14. CMA - Anticipated Acquisition of Haynes International by Acerinox: Full Text Decision
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct customer evidence in paragraphs xx.xx-xx.xx supports separate flat/long purchasing pools; no published market-share table is used.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Shape-specific purchasing supports a distinct long-stock allocation model without proving a separate competitive market for billet.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.

15. Haynes International - HAYNES 230
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
16. Carpenter Technology - Advanced Materials for Aerospace Motor & Engines
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))
17. Elementum 3D - Metal Alloy Additive Manufacturing Colorado
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed. ([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed. ([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))
18. NASA - NASA-Developed Printable Metal Can Take the Heat
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake. ([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake. ([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

19. Carpenter Technology - Lighter, Faster, Stronger Metallurgy for Defense, July 2025

    · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
    ([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

    · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
    ([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

20. Special Metals - Aerospace

    · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight.
    ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

    · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight.
    ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

    · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy xx.xx; no sales weight is disclosed.
    ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

    · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy X-xx.xx; no current sales quantity is disclosed.
    ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

    · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Waspaloy; no sales weight is disclosed.
    ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

21. Boeing - BDS Terms and Conditions Guide, D607 Material Substitution Prohibition, November 15, 2013

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: D607 prohibits unauthorized material substitutions while recognizing specified alternatives. It constrains assumptions about frictionless cross-class substitution, without quantifying adoption delays. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization requirements qualify assumptions about precipitation-family substitution opportunities; the clause does not prove future purchases or a class-growth premium. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause prohibits unauthorized substitutions where contractually applicable. It constrains the adoption interpretation but does not establish approval prevalence or a numerical adoption rate. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific material authorization is a counterweight to treating a named offering as immediately substitutable production material. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization limits interpretation of the assumed adoption multiplier; it does not directly establish powder sales. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))

22. Precision Castparts Corp. - Fiscal 2015 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.

23. NASA - Chapter 2: Aerospace Materials Characteristics

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

24. ESA - ESA Space Environment Report 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
25. NASA and Superalloys: A Customer, a Participant, and a Referee
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
26. VDM Metals - Alloys for the Aerospace Industry
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
27. Carpenter Technology - Business Segments
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))

28. Howmet Aerospace - 2025 Annual Report, Letter to Shareholders

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% combined aerospace and gas-turbine spares revenue constrains the distinction between initial-production and spare-component activity; material and destination adjustments remain modeled. ([howmet.com](https://www.howmet.com/annualreport/))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed combined spares proportion supplies the replacement proxy; approximately xx.xx% commercial aerospace engine-spares growth is historical counterevidence against assuming weak aftermarket activity. ([howmet.com](https://www.howmet.com/annualreport/))

29. GE Aerospace - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment and services costs provide commercial budget anchors for the common material-value denominator; assumed eligible-material fractions prevent full equipment or service value from entering the allocation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Services include spare parts and maintenance activity, supporting an explicit new-article versus restoration attribution rather than equating services revenue with replacement-material purchases. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported USD xx.xx services cost anchors the restoration-material bridge; the restoration allocation and direct eligible-material fraction are assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Total funded R&D of USD xx.xx supplies a development-budget proxy, not observed nickel-material purchasing; only an assumed eligible-material fraction is used. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.

30. Rolls-Royce Holdings Plc - 2025 Full Year Results

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2028 shop-visit target is below the reported 2025 total despite prospective fleet growth, qualifying any automatic conversion of fleet expansion into proportionate maintenance-material purchasing.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The divergence between 2025 engine deliveries and shop visits independently challenges a uniform new-engine-led material forecast; no service revenue is included in the numerator.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Observed engine-delivery and shop-visit activity supports separate new-program and replacement-demand assumptions, not a proportional material-purchase conversion.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

31. UKRI - Accelerating Manufacturing Readiness level of ABD-1000AM for AM of high temperature aerospace components (AMRAM1000)
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The Alloyed-led project has xx.xx of funding and an April 2025-October 2026 funded period. This independently establishes bounded development activity, not annual material sales or recurring production purchases. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
32. Safran - FY 2025 Results and Investor Update, February 13, 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))

33. Airbus - Full-Year 2025 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 deliveries by aircraft family provide the starting activity comparison for the initial-production forecast; aircraft delivery value is not included in the material numerator. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx% decline in 2025 self-financed R&D is counterevidence to uniform development-budget acceleration and supports a restrained, explicitly assumed development-purchasing scenario. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.

34. Airbus - Half-Year 2026 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 update retained the A320-family, A350 and other production-rate targets, providing a dated commercial constraint on the initial-production activity scenario rather than proof of future material orders. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: First-half 2026 self-financed R&D of EUR xx.xx versus EUR xx.xx provides a modest-growth countercheck for the assumed development-project activity path; the budget is not material-market revenue. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))

35. RTX Corporation - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

36. Federal Reserve Bank of St. Louis - Annual USD/GBP Exchange Rate, AEXUSUK
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
37. L3Harris Technologies, Inc. - Fiscal 2025 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
38. FAA Aerospace Forecast Fiscal Years 2025-2045 - Commercial Space
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated official low/high scenarios provide FY2032 licensed launch/reentry activity bounds. Their U.S.-licensed scope and treatment of reusable vehicles prevent direct conversion into Global material revenue. ([faa.gov](https://www.faa.gov/data_research/aviation/aerospace_forecasts/2025-commercial-space.pdf))
39. ICAO - Convention on International Civil Aviation, Ninth Edition
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))

40. DFARS 252.225-7009 - Restriction on Acquisition of Certain Articles Containing Specialty Metals
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
41. Aubert & Duval - Space Industry Metallurgical Solutions
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
42. Aubert & Duval - Metallurgical Solutions for the Defense Industry, June 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
43. Berkshire Hathaway Inc. - 2025 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.

44. Lufthansa Group Annual Report 2025 - MRO business segment
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
45. Oliver Wyman - Global Fleet And MRO Market Forecast 2026-2036: Key Trends
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
46. German Aerospace Center (DLR) - Financing
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
47. Federal Aviation Administration - Parts Manufacturer Approval (PMA): Design Approval
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.

48. Rolled Alloys - E-Services Stocking Programs
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
49. Boeing BDS Terms and Conditions Guide - D604 Raw Material Risk Mitigation
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
50. Carpenter Technology Corporation - Second Quarter Fiscal 2026 Earnings Call Presentation, January 29, 2026
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation distinguishes specialized non-LTA business from a conventional spot market, countering automatic classification of transactional sales as stock.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Three additional aerospace LTAs and xx.xx% sequential commercial-aerospace bookings growth inform the reservation hypothesis, but do not measure its modeled magnitude.
51. Precision Castparts Corp. - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.

52. Howmet Aerospace - United States Locations
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.

53. ATI Inc. - 2024 Annual Report
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New sales commitments through 2040, including amounts expected during the remainder of the decade and predominantly involving jet-engine nickel alloys, inform the direct-program forecast premise without being counted as realized sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% of fiscal-2024 plate volume went to independent service centers, providing a historical comparison that cautions against assuming generalized intermediary displacement.

54. Alloyed - About
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.

55. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 aerospace realization and revenue provide the common monetary calibration for this modeled grade; neither is a grade-specific sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace material realization supplies a price-scale input, with modeled year and product-mix adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization calibrates the assumed blended material price, not this grade's observed revenue. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace realization provides a shared monetary comparison for the assumed grade price. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported eight-to-ten-year aerospace application-introduction periods constrain interpretation of the seven-year adoption forecast. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace application-introduction periods provide an adoption-delay counterweight, not a forecast sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
56. European Commission CORDIS - Welding Metallurgy and Cracking in Superalloys: Reporting
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical all-sector tonnage discussion is only a dominance cross-check; it cannot establish current aerospace monetary share. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies 718Plus separately from ordinary xx.xx supporting identity separation without supplying a current sales weight. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
57. Special Metals - Alloy Surcharge Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: August-October 2026 grade surcharges provide a differentiated cost-exposure check, not full invoice prices or observed 2032 prices. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx surcharge sequence independently qualifies a uniform price assumption; it is not substituted for a material selling price. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The grade-specific surcharge listing is a commercial cost comparison, not an observed Global grade realization. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))

58. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current-and-past supplier identity mapping only; not proof of 2025 aerospace sales or the modeled volume. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: CMSX-xx.xx is separately identified; the material-value weight remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current sales are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713C is listed separately from IN-713LC; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713LC is listed separately from IN-713C; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx identity mapping only; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-738LC is separately identified; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current aerospace tonnes are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx appears in a current-and-past identification list; this does not establish recurring aerospace production sales. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: MAR-M xx.xx is identified separately from CM247LC; monetary weights remain modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PWA xx.xx is separately identified; no attributable sales value is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; current commercial scale remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; no current grade-specific material sales are disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Udimet xx.xx appears in the supplier's current-and-past identities; aerospace attribution is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

59. GE Aerospace - Safety First: A Retiring GE Aerospace Materials Engineer Made Protecting Lives His Mission
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
60. Aubert & Duval - AD730: Ni-Based Superalloy for High Temperature Applications
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
61. University of Portsmouth - Improved Creep-Fatigue-Oxidation Resistance in Gas Turbine Disc Materials: REF Impact Case Study
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))

62. Influence of Long Term Exposure in Air on Microstructure, Surface Stability and Mechanical Properties of UDIMET 720LI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The aerospace-industry publication distinguishes conventional Udimet xx.xx from its 720Li derivative; it does not establish a current monetary allocation. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The publication independently supports the 720Li identity and aircraft-engine-disc category, without supplying current sales. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

63. NASA Contractor Report 174639 - Literature Survey on Oxidations and Fatigue Lives at Elevated Temperatures

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical institutional material identification is a legacy-category anchor only; it does not demonstrate current aerospace material sales. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

64. America Makes - 5566.002 Proliferation of Nickel Superalloy Material Datasets for Powder Bed Fusion Additive Manufacturing

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))

65. GE Aerospace - Fourth Quarter 2025 Earnings Presentation

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 commercial-engine delivery growth supplies a near-term demand cross-check, not a grade-specific purchasing or seven-year growth observation. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aggregate commercial and defense delivery growth constrains the commercial-demand scenario without establishing this grade's attributable consumption. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported defense-engine delivery growth is a demand-exposure check only; the PWA xx.xx activity factor remains assumed. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

16.6. Africa

Table 316. Africa Nickel-Based Superalloys for Aerospace Market, by Country growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Egypt	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Kenya	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nigeria	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Unallocated / remaining scope	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 317. Africa Nickel-Based Superalloys for Aerospace Market Size, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Egypt	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Kenya	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nigeria	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 318. Africa Nickel-Based Superalloys for Aerospace Market Size, by Product Form, 2017-2040 (USD Million)

Product Form	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Bars, Rods and Profiles	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Billets and Forging Stock	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ingots	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Plate, Sheet, Strip and Foil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Powder	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Tubes and Pipes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Wire	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 319. Africa Nickel-Based Superalloys for Aerospace Market Size, by Strengthening Class, 2017-2040 (USD Million)

Strengthening Class	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Dispersion-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Precipitation-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Solid-Solution-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 320. Africa Nickel-Based Superalloys for Aerospace Market Size, by Component Application, 2017-2040 (USD Million)

Component Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Breathing Propulsion & Auxiliary Power	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Systems & Equipment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rocket & Spacecraft Propulsion	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Vehicle Structures & Thermal Protection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 321. Africa Nickel-Based Superalloys for Aerospace Market Size, by Air-Breathing Propulsion & Auxiliary Power, 2017-2040 (USD Million)

Air-Breathing Propulsion & Auxiliary Power	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combustion & Exhaust Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Compressor Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine Structures & Auxiliary Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Blades & Vanes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Disks & Rotor Hardware	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 322. Africa Nickel-Based Superalloys for Aerospace Market Size, by Demand Stage, 2017-2040 (USD Million)

Demand Stage	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Initial Equipment Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Repair, Overhaul & Refurbishment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Replacement & Retrofit Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research, Development & Qualification	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 323. Africa Nickel-Based Superalloys for Aerospace Market Size, by Aerospace End Market, 2017-2040 (USD Million)

Aerospace End Market	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Civil & Nonmilitary State Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Guided Missile Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Military Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Space Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 324. Africa Nickel-Based Superalloys for Aerospace Market Size, by Buyer Function, 2017-2040 (USD Million)

Buyer Function	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Aerospace Vehicle Manufacturers & Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Component & Subassembly Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine & Propulsion-System Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Maintenance, Repair & Overhaul Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Development Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 325. Africa Nickel-Based Superalloys for Aerospace Market Size, by Fulfillment Model, 2017-2040 (USD Million)

Fulfillment Model	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Order-Dedicated Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stock Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 326. Africa Nickel-Based Superalloys for Aerospace Market Size, by Supply Channel, 2017-2040 (USD Million)

Supply Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Captive Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent Intermediary Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Producer-Direct Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 327. Africa Nickel-Based Superalloys for Aerospace Market Size, by Alloy Grade, 2017-2040 (USD Million)

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ABD-1000AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
ABD-900AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
AD730	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy 718Plus	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy X-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CM247LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CMSX-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hastelloy X	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713C	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 327 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
IN-713LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-738LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
MAR-M xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic 80A	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene 88DT	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
RR1000	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet 720Li	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Waspaloy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. ATI Inc. - 2025 Form 10-K

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC's reported financial/product-category inputs and listed ingot offering constrain the eligible material envelope; the ingot allocation remains assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: AA&S sales of USD xx.xx and its xx.xx% nickel-based/specialty-alloy category anchor the separately adjusted rolled-material envelope.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial jet-engine revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025, supporting purchasing recovery but not identifying price growth or a 2032 material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))

2. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
3. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Narrow-strip supply supports a limited flat-product allocation within the modeled eligible Carpenter envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire is a disclosed supplied form; its eligible monetary weight remains modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.

4. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical xx.xx% slab/bar/billet revenue category constrains the long-stock proxy; its eligible billet split is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported combined stock category provides a proxy anchor, not a separately disclosed bar revenue share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 flat products represented approximately xx.xx% of net product revenue; extrapolation to the eligible Acerinox envelope is modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 wire represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 tubulars represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical product revenue, channel mix and backlog conversion anchor the modeled stock value weight, with explicit scope adjustments.

5. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Casting-alloy activities support an ingot-material equivalent rather than attributing full engine-component revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed metal/billet activities support retaining a forging-stock allocation; the assumed xx.xx% weight is not reported.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported 2025 sales of USD xx.xx and Engine Products aerospace revenues of USD xx.xx commercial and USD xx.xx defense establish the component-cohort scale; USD xx.xx gas-turbine revenue is excluded through an explicit attribution model. These are not material-market revenues. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The segment/end-market revenue table supplies the aerospace and gas-turbine boundaries needed to bridge combined spares activity into an aerospace replacement-material proxy. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial aerospace represented xx.xx% of 2025 company sales, supplying an independent downstream mix comparison rather than a nickel-material allocation weight. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense aerospace represented xx.xx% of 2025 company sales; the paired commercial/defense comparison tests the aviation model while retaining component and material-scope differences. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.

6. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: GE describes repaired/serviceable-part reuse, supporting a counterforce to converting aftermarket activity directly into newly supplied material purchases. Its reported approximately xx.xx% strategic-nickel revert content is not deducted from the terminal-material market. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Commercial repair and component reuse support retaining uncertainty around replacement-related combustion material purchases. The selected procurement-intensity offset remains an assumption, not a measured avoided-purchase percentage. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
7. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Includes exposure outside the mandatory-country group.
8. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Flat-product import input.

9. Special Metals - Tech Center
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised ingot supply establishes a PCC material-form crosswalk, not its sales weight.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised billet supply supports the forging-stock category mapping within the inherited PCC envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised bar supply supports classification only; the monetary coefficient is an assumption.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Plate, sheet and strip offerings support a distinct flat-product allocation premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire availability supports the material-form crosswalk without establishing revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Tubing availability supports the material-form crosswalk without establishing revenue.
10. DPC Holdings Limited - Registration Statement with 2025 Financial Statements
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing separates ingots from component sales and describes external supply and xx.xx% internal superalloy sourcing, contradicting the inherited xx.xx% captive parameter.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
11. Acerinox - Results FY 2025
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned US long-product expansion supports the relative conventional-long-material premise; investment is not recognized as sales.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately USD xx.xx of planned platform investment includes expansion of the long-products offering, informing the bars forecast premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace demand and planned long-product diversification support testing a relative mix shift without assuming flat-product contraction.

12. Haynes International - HAYNES 282
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Powder is offered alongside conventional forms for HAYNES xx.xx supporting nonexclusive form classification, not an observed sales allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
13. CMA - Anticipated Acquisition of Haynes International by Acerinox: Full Text Decision
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct customer evidence in paragraphs xx.xx-xx.xx supports separate flat/long purchasing pools; no published market-share table is used.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Shape-specific purchasing supports a distinct long-stock allocation model without proving a separate competitive market for billet.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.

14. Haynes International - HAYNES 230
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
15. Carpenter Technology - Advanced Materials for Aerospace Motor & Engines
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))
16. Elementum 3D - Metal Alloy Additive Manufacturing Colorado
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed. ([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed. ([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))
17. NASA - NASA-Developed Printable Metal Can Take the Heat
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake. ([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake. ([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

18. Carpenter Technology - Lighter, Faster, Stronger Metallurgy for Defense, July 2025

    · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
    ([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

    · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
    ([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

19. Special Metals - Aerospace

    · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight.
    ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

    · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight.
    ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

    · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy xx.xx; no sales weight is disclosed.
    ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

    · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy X-xx.xx; no current sales quantity is disclosed.
    ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

    · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Waspaloy; no sales weight is disclosed.
    ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

20. Boeing - BDS Terms and Conditions Guide, D607 Material Substitution Prohibition, November 15, 2013
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: D607 prohibits unauthorized material substitutions while recognizing specified alternatives. It constrains assumptions about frictionless cross-class substitution, without quantifying adoption delays. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization requirements qualify assumptions about precipitation-family substitution opportunities; the clause does not prove future purchases or a class-growth premium. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause prohibits unauthorized substitutions where contractually applicable. It constrains the adoption interpretation but does not establish approval prevalence or a numerical adoption rate. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific material authorization is a counterweight to treating a named offering as immediately substitutable production material. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization limits interpretation of the assumed adoption multiplier; it does not directly establish powder sales. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))

21. Precision Castparts Corp. - Fiscal 2015 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.

22. NASA - Chapter 2: Aerospace Materials Characteristics

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

23. ESA - ESA Space Environment Report 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
24. NASA and Superalloys: A Customer, a Participant, and a Referee
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
25. VDM Metals - Alloys for the Aerospace Industry
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
26. Carpenter Technology - Business Segments
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))

27. Howmet Aerospace - 2025 Annual Report, Letter to Shareholders

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% combined aerospace and gas-turbine spares revenue constrains the distinction between initial-production and spare-component activity; material and destination adjustments remain modeled. ([howmet.com](https://www.howmet.com/annualreport/))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed combined spares proportion supplies the replacement proxy; approximately xx.xx% commercial aerospace engine-spares growth is historical counterevidence against assuming weak aftermarket activity. ([howmet.com](https://www.howmet.com/annualreport/))

28. GE Aerospace - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment and services costs provide commercial budget anchors for the common material-value denominator; assumed eligible-material fractions prevent full equipment or service value from entering the allocation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Services include spare parts and maintenance activity, supporting an explicit new-article versus restoration attribution rather than equating services revenue with replacement-material purchases. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported USD xx.xx services cost anchors the restoration-material bridge; the restoration allocation and direct eligible-material fraction are assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Total funded R&D of USD xx.xx supplies a development-budget proxy, not observed nickel-material purchasing; only an assumed eligible-material fraction is used. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.

29. Rolls-Royce Holdings Plc - 2025 Full Year Results

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2028 shop-visit target is below the reported 2025 total despite prospective fleet growth, qualifying any automatic conversion of fleet expansion into proportionate maintenance-material purchasing.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The divergence between 2025 engine deliveries and shop visits independently challenges a uniform new-engine-led material forecast; no service revenue is included in the numerator.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Observed engine-delivery and shop-visit activity supports separate new-program and replacement-demand assumptions, not a proportional material-purchase conversion.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

30. UKRI - Accelerating Manufacturing Readiness level of ABD-1000AM for AM of high temperature aerospace components (AMRAM1000)
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The Alloyed-led project has xx.xx of funding and an April 2025-October 2026 funded period. This independently establishes bounded development activity, not annual material sales or recurring production purchases. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
31. Safran - FY 2025 Results and Investor Update, February 13, 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))

32. Airbus - Full-Year 2025 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 deliveries by aircraft family provide the starting activity comparison for the initial-production forecast; aircraft delivery value is not included in the material numerator. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx% decline in 2025 self-financed R&D is counterevidence to uniform development-budget acceleration and supports a restrained, explicitly assumed development-purchasing scenario. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.

33. Airbus - Half-Year 2026 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 update retained the A320-family, A350 and other production-rate targets, providing a dated commercial constraint on the initial-production activity scenario rather than proof of future material orders. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: First-half 2026 self-financed R&D of EUR xx.xx versus EUR xx.xx provides a modest-growth countercheck for the assumed development-project activity path; the budget is not material-market revenue. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))

34. RTX Corporation - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

35. Federal Reserve Bank of St. Louis - Annual USD/GBP Exchange Rate, AEXUSUK
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
36. L3Harris Technologies, Inc. - Fiscal 2025 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
37. FAA Aerospace Forecast Fiscal Years 2025-2045 - Commercial Space
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated official low/high scenarios provide FY2032 licensed launch/reentry activity bounds. Their U.S.-licensed scope and treatment of reusable vehicles prevent direct conversion into Global material revenue. ([faa.gov](https://www.faa.gov/data_research/aviation/aerospace_forecasts/2025-commercial-space.pdf))
38. ICAO - Convention on International Civil Aviation, Ninth Edition
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))

39. DFARS 252.225-7009 - Restriction on Acquisition of Certain Articles Containing Specialty Metals
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
40. Aubert & Duval - Space Industry Metallurgical Solutions
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
41. Aubert & Duval - Metallurgical Solutions for the Defense Industry, June 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
42. Berkshire Hathaway Inc. - 2025 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.

43. Lufthansa Group Annual Report 2025 - MRO business segment
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
44. Oliver Wyman - Global Fleet And MRO Market Forecast 2026-2036: Key Trends
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
45. German Aerospace Center (DLR) - Financing
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
46. Federal Aviation Administration - Parts Manufacturer Approval (PMA): Design Approval
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.

47. Rolled Alloys - E-Services Stocking Programs
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
48. Boeing BDS Terms and Conditions Guide - D604 Raw Material Risk Mitigation
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
49. Carpenter Technology Corporation - Second Quarter Fiscal 2026 Earnings Call Presentation, January 29, 2026
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation distinguishes specialized non-LTA business from a conventional spot market, countering automatic classification of transactional sales as stock.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Three additional aerospace LTAs and xx.xx% sequential commercial-aerospace bookings growth inform the reservation hypothesis, but do not measure its modeled magnitude.
50. Precision Castparts Corp. - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.

51. Howmet Aerospace - United States Locations
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
52. ATI Inc. - 2024 Annual Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New sales commitments through 2040, including amounts expected during the remainder of the decade and predominantly involving jet-engine nickel alloys, inform the direct-program forecast premise without being counted as realized sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% of fiscal-2024 plate volume went to independent service centers, providing a historical comparison that cautions against assuming generalized intermediary displacement.
53. Alloyed - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.

54. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 aerospace realization and revenue provide the common monetary calibration for this modeled grade; neither is a grade-specific sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace material realization supplies a price-scale input, with modeled year and product-mix adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization calibrates the assumed blended material price, not this grade's observed revenue. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace realization provides a shared monetary comparison for the assumed grade price. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported eight-to-ten-year aerospace application-introduction periods constrain interpretation of the seven-year adoption forecast. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace application-introduction periods provide an adoption-delay counterweight, not a forecast sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
55. European Commission CORDIS - Welding Metallurgy and Cracking in Superalloys: Reporting
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical all-sector tonnage discussion is only a dominance cross-check; it cannot establish current aerospace monetary share. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies 718Plus separately from ordinary xx.xx supporting identity separation without supplying a current sales weight. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
56. Special Metals - Alloy Surcharge Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: August-October 2026 grade surcharges provide a differentiated cost-exposure check, not full invoice prices or observed 2032 prices. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx surcharge sequence independently qualifies a uniform price assumption; it is not substituted for a material selling price. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The grade-specific surcharge listing is a commercial cost comparison, not an observed Global grade realization. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))

57. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current-and-past supplier identity mapping only; not proof of 2025 aerospace sales or the modeled volume. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: CMSX-xx.xx is separately identified; the material-value weight remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current sales are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713C is listed separately from IN-713LC; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713LC is listed separately from IN-713C; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx identity mapping only; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-738LC is separately identified; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current aerospace tonnes are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx appears in a current-and-past identification list; this does not establish recurring aerospace production sales. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: MAR-M xx.xx is identified separately from CM247LC; monetary weights remain modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PWA xx.xx is separately identified; no attributable sales value is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; current commercial scale remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; no current grade-specific material sales are disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Udimet xx.xx appears in the supplier's current-and-past identities; aerospace attribution is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

58. GE Aerospace - Safety First: A Retiring GE Aerospace Materials Engineer Made Protecting Lives His Mission
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
59. Aubert & Duval - AD730: Ni-Based Superalloy for High Temperature Applications
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
60. University of Portsmouth - Improved Creep-Fatigue-Oxidation Resistance in Gas Turbine Disc Materials: REF Impact Case Study
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))

61. Influence of Long Term Exposure in Air on Microstructure, Surface Stability and Mechanical Properties of UDIMET 720LI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The aerospace-industry publication distinguishes conventional Udimet xx.xx from its 720Li derivative; it does not establish a current monetary allocation. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The publication independently supports the 720Li identity and aircraft-engine-disc category, without supplying current sales. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

62. NASA Contractor Report 174639 - Literature Survey on Oxidations and Fatigue Lives at Elevated Temperatures

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical institutional material identification is a legacy-category anchor only; it does not demonstrate current aerospace material sales. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

63. America Makes - 5566.002 Proliferation of Nickel Superalloy Material Datasets for Powder Bed Fusion Additive Manufacturing

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))

64. GE Aerospace - Fourth Quarter 2025 Earnings Presentation

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 commercial-engine delivery growth supplies a near-term demand cross-check, not a grade-specific purchasing or seven-year growth observation. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aggregate commercial and defense delivery growth constrains the commercial-demand scenario without establishing this grade's attributable consumption. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported defense-engine delivery growth is a demand-exposure check only; the PWA xx.xx activity factor remains assumed. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

17. Nickel-Based Superalloys for Aerospace Market, by Group

Americas is useful for coordinating customer coverage, but not as a common material-origin designation. ▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪ Sellers should organize regional account support around actual ordering entities while assessing each cross-border transaction separately.

▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ An EMEA distribution agreement should therefore specify the destinations, importer responsibilities, and customer permissions it actually covers. A single regional representative can consolidate account administration, but should not be treated as evidence of uniform market access across these constituents.

European Union provides a concrete inventory-location choice. ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪ ▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪ ▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ A centralized arrangement is useful only when it also preserves the required material identity and customer documentation; separate customer approvals can limit otherwise convenient redistribution.

▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ An inventory hub serving Nordic customers consequently needs destination-specific customs treatment rather than an assumption of identical movement conditions. Consolidated regional support remains possible, but warehouse selection and importer responsibility should follow the actual customer destinations.

ASEAN preferential access depends on origin, not merely on the location of a stocking seller. ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪ ▪▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ A preferential route is commercially relevant only when the particular material qualifies and the required origin evidence accompanies the transaction.

GCC offers a common customs-administration framework, but not a substitute for destination verification. ▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪

RESEARCH SAMPLE REPORT

[illegible] The common framework can support coordinated administration; current national implementation and any special import status still need confirmation before delivery commitments are made.

[illegible] Buyers should compare direct importation with regional stocking on the basis of the actual origin entitlement, delivery obligation, and documentation. Consolidation is less attractive when it introduces another commercial handoff without a corresponding fulfillment benefit.

BRICS trade ministers' calls for joint value-chain cooperation are policy signals rather than material awards. Constituent examples remain commercially different: India's reported material-airworthiness clearance concerns a national approval relationship, while Brazil's Celma is an OEM-owned maintenance setting. [illegible]

G7 is an informal coordination forum, not a single superalloy purchasing jurisdiction. Its EU and non-EU constituents should not be treated as one import or customer-approval territory. [illegible]

[illegible] Covered specialty-metal contracts require examination of the applicable clause and exceptions. European Union, Nordic, NATO, G7, BRICS, and the broader regional groups overlap; their commercial coverage is non-additive and should not be treated as separate cumulative opportunities.

Figure 29. Global Nickel-Based Superalloys for Aerospace Market Size, by Group, 2025 vs 2026 vs 2032

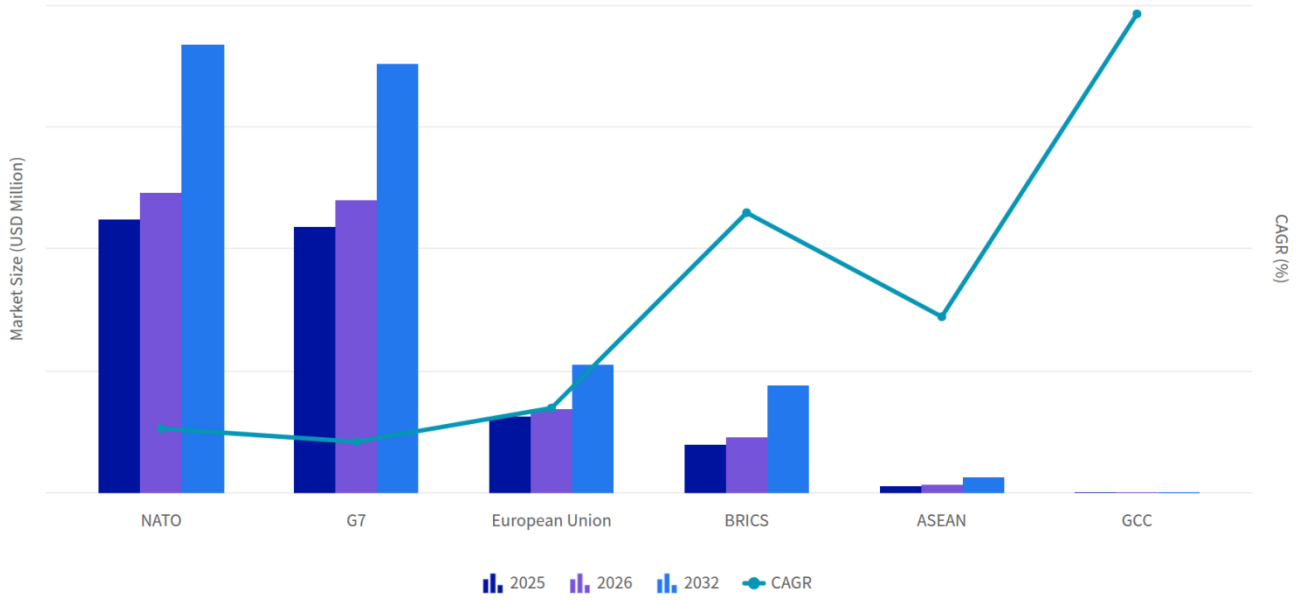

Table 328. Global Nickel-Based Superalloys for Aerospace Market Size, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Sources & Evidence

1. DFARS 252.225-7009 - Restriction on Acquisition of Certain Articles Containing Specialty Metals

   · DFARS xx.xx-xx.xx recognizes qualifying-country origins and specified exceptions for specialty metals incorporated in covered articles, rather than alliance membership as the operative condition. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))

2. GE Aerospace - Commercial and Defense Engines in Latin America

   · Celma's Brazilian OEM-owned maintenance role illustrates a constituent-specific business relationship within Americas and BRICS coverage. ([geaerospace.com](https://www.geaerospace.com/commercial-latam))

3. European Commission - Importation

   · The European Commission explains that release for free circulation permits movement within EU customs territory after applicable import requirements are satisfied. This supports the conditional shared-stock interpretation. ([taxation-customs.ec.europa.eu](https://taxation-customs.ec.europa.eu/customs/customs-procedures-import-and-export/importation_en))

4. European Free Trade Association - Q&A About the EEA Agreement
   · EFTA explains that EEA participation does not include the EU customs union or common trade policy, supporting a distinction between EU and non-EU Nordic destinations. ([efta.int](https://www.efta.int/eea-relations-eu/qa-about-eea-agreement))
5. Malaysia Ministry of Investment, Trade and Industry - Rules of Origin
   · Malaysia's ATIGA guidance requires origin compliance and consideration of product-specific rules before preferential treatment. Resale location alone is not established as entitlement. ([miti.gov.my](https://www.miti.gov.my/index.php/pages/view/2071))
6. Australian Department of Foreign Affairs and Trade - Australia-New Zealand Closer Economic Relations Trade Agreement
   · Australia's CER guidance ties preferential trans-Tasman goods treatment to ANZCERTA origin criteria, supporting transaction-specific assessment within Australasia. ([dfat.gov.au](https://www.dfat.gov.au/trade/agreements/in-force/anzcerta/australia-new-zealand-closer-economic-relations-trade-agreement))
7. GCC - Unified Guide for Customs Procedures at First Points of Entry, 2015
   · The GCC's 2015 unified guide describes common import administration while retaining importer documentation and permissions for restricted goods; current destination treatment remains a separate verification need. ([gcc-sg.org](https://gcc-sg.org/en/MediaCenter/DigitalLibrary/Documents/xx.xx.pdf))
8. Canada Border Services Agency - Memorandum D11-5-17: CUSMA Rules of Origin
   · CBSA's memorandum identifies the Canada-United States-Mexico rules-of-origin framework, supporting its distinction from the broader Americas coverage group. ([cbsa-asfc.gc.ca](https://www.cbsa-asfc.gc.ca/publications/dm-md/d11/d11-xx.xx-xx.xx-eng.html))
9. BRICS Trade Ministers - Joint Communiqué
   · The BRICS trade-ministerial communiqué calls for joint value-chain and supply-chain cooperation. This is policy coordination, not evidence of a particular material award or customer authorization. ([gov.br](https://www.gov.br/memp/pt-br/assuntos/brics-sme-working-group-xx.xx/documents-on-smes/2024-russia/brics_ministerial-statement_final_clean.pdf/%xx.xx%40display-file/file))
10. G7 Italia - About the G7
    · The official G7 description identifies an informal forum comprising the named EU and non-EU countries, supporting coordination analysis rather than a common purchasing-jurisdiction assumption. ([g7italy.it](https://www.g7italy.it/en/about-g7/))
11. NATO - What Is NATO?
    · NATO's official Ally roster includes Iceland and does not include Japan, supporting the comparison with the separate DFARS country framework. ([nato.int](https://www.nato.int/en/what-is-nato.html))
12. DFARS 225.872-1 - General
    · DFARS xx.xx-xx.xx lists Japan among qualifying countries and does not list Iceland, demonstrating a boundary different from NATO membership. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-general.))
13. MIDHANI - Indigenous Aero-Engine Material Qualification: CEMILAC Certification
    · MIDHANI reports CEMILAC clearance of specified superalloy grades and forms for aero-engine series production, illustrating a national approval relationship within BRICS coverage. ([midhani-india.in](https://midhani-india.in/news_marquee/midhani-achieves-major-milestone-in-indigenous-aero-engine-material-qualification-cemilac-certification/))
14. ATI Inc. - 2025 Form 10-K
    · Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
15. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
    · Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.

16. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
17. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
18. Howmet Aerospace Inc. - 2025 Form 10-K
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
19. GE Aerospace - 2025 Sustainability Report
    - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
    - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
    - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.

17.1. NATO

Table 329. NATO Nickel-Based Superalloys for Aerospace Market, by Country growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Albania	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Belgium	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Bulgaria	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Croatia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Czech Republic	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Denmark	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Estonia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 329 - continued

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Finland	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Greece	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hungary	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Iceland	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latvia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Lithuania	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Luxembourg	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Montenegro	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Netherlands	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North Macedonia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Norway	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Poland	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Portugal	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Romania	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Slovakia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Slovenia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Sweden	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turkey	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 330. NATO Nickel-Based Superalloys for Aerospace Market Size, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Albania	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Belgium	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 330 - continued

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Bulgaria	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Croatia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Czech Republic	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Denmark	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Estonia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Finland	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Greece	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hungary	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Iceland	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latvia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Lithuania	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Luxembourg	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Montenegro	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Netherlands	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North Macedonia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Norway	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Poland	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Portugal	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Romania	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Slovakia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Slovenia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Sweden	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turkey	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 331. NATO Nickel-Based Superalloys for Aerospace Market Size, by Product Form, 2017-2040 (USD Million)

Product Form	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Bars, Rods and Profiles	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Billets and Forging Stock	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ingots	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Plate, Sheet, Strip and Foil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Powder	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Tubes and Pipes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Wire	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 332. NATO Nickel-Based Superalloys for Aerospace Market Size, by Strengthening Class, 2017-2040 (USD Million)

Strengthening Class	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Dispersion-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Precipitation-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Solid-Solution-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 333. NATO Nickel-Based Superalloys for Aerospace Market Size, by Component Application, 2017-2040 (USD Million)

Component Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Breathing Propulsion & Auxiliary Power	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Systems & Equipment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rocket & Spacecraft Propulsion	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Vehicle Structures & Thermal Protection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 334. NATO Nickel-Based Superalloys for Aerospace Market Size, by Air-Breathing Propulsion & Auxiliary Power, 2017-2040 (USD Million)

Air-Breathing Propulsion & Auxiliary Power	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combustion & Exhaust Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Compressor Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine Structures & Auxiliary Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Blades & Vanes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Disks & Rotor Hardware	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 335. NATO Nickel-Based Superalloys for Aerospace Market Size, by Demand Stage, 2017-2040 (USD Million)

Demand Stage	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Initial Equipment Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Repair, Overhaul & Refurbishment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Replacement & Retrofit Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research, Development & Qualification	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 336. NATO Nickel-Based Superalloys for Aerospace Market Size, by Aerospace End Market, 2017-2040 (USD Million)

Aerospace End Market	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Civil & Nonmilitary State Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Guided Missile Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Military Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Space Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 337. NATO Nickel-Based Superalloys for Aerospace Market Size, by Buyer Function, 2017-2040 (USD Million)

Buyer Function	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Aerospace Vehicle Manufacturers & Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Component & Subassembly Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine & Propulsion-System Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Maintenance, Repair & Overhaul Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Development Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 338. NATO Nickel-Based Superalloys for Aerospace Market Size, by Fulfillment Model, 2017-2040 (USD Million)

Fulfillment Model	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Order-Dedicated Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stock Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 339. NATO Nickel-Based Superalloys for Aerospace Market Size, by Supply Channel, 2017-2040 (USD Million)

Supply Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Captive Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent Intermediary Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Producer-Direct Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 340. NATO Nickel-Based Superalloys for Aerospace Market Size, by Alloy Grade, 2017-2040 (USD Million)

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ABD-1000AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
ABD-900AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 340 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
AD730	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy 718Plus	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy X-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CM247LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CMSX-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hastelloy X	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713C	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-738LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
MAR-M xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic 80A	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene 88DT	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 340 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
RR1000	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet 720Li	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Waspaloy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. ATI Inc. - 2025 Form 10-K

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC's reported financial/product-category inputs and listed ingot offering constrain the eligible material envelope; the ingot allocation remains assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: AA&S sales of USD xx.xx and its xx.xx% nickel-based/specialty-alloy category anchor the separately adjusted rolled-material envelope.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial jet-engine revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025, supporting purchasing recovery but not identifying price growth or a 2032 material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))

2. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
3. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Narrow-strip supply supports a limited flat-product allocation within the modeled eligible Carpenter envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire is a disclosed supplied form; its eligible monetary weight remains modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.

4. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical xx.xx% slab/bar/billet revenue category constrains the long-stock proxy; its eligible billet split is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported combined stock category provides a proxy anchor, not a separately disclosed bar revenue share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 flat products represented approximately xx.xx% of net product revenue; extrapolation to the eligible Acerinox envelope is modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 wire represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 tubulars represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical product revenue, channel mix and backlog conversion anchor the modeled stock value weight, with explicit scope adjustments.

5. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Casting-alloy activities support an ingot-material equivalent rather than attributing full engine-component revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed metal/billet activities support retaining a forging-stock allocation; the assumed xx.xx% weight is not reported.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported 2025 sales of USD xx.xx and Engine Products aerospace revenues of USD xx.xx commercial and USD xx.xx defense establish the component-cohort scale; USD xx.xx gas-turbine revenue is excluded through an explicit attribution model. These are not material-market revenues. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The segment/end-market revenue table supplies the aerospace and gas-turbine boundaries needed to bridge combined spares activity into an aerospace replacement-material proxy. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial aerospace represented xx.xx% of 2025 company sales, supplying an independent downstream mix comparison rather than a nickel-material allocation weight. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense aerospace represented xx.xx% of 2025 company sales; the paired commercial/defense comparison tests the aviation model while retaining component and material-scope differences. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.

6. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: GE describes repaired/serviceable-part reuse, supporting a counterforce to converting aftermarket activity directly into newly supplied material purchases. Its reported approximately xx.xx% strategic-nickel revert content is not deducted from the terminal-material market. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Commercial repair and component reuse support retaining uncertainty around replacement-related combustion material purchases. The selected procurement-intensity offset remains an assumption, not a measured avoided-purchase percentage. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
7. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
8. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2023
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Older bar-import input; not a 2025 aerospace sales observation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Older bar-import input.
9. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.

10. TEI - TEI Provides MRO Services to International Fighter Aircraft, January 30, 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Maintenance performed in Turkey for overseas operators supports service-location attribution rather than airline-country allocation; material intensity remains assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Maintenance performed in Turkey for overseas operators supports service-location attribution rather than airline-country allocation; material intensity remains assumed.
11. Special Metals - Tech Center
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised ingot supply establishes a PCC material-form crosswalk, not its sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised billet supply supports the forging-stock category mapping within the inherited PCC envelope.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised bar supply supports classification only; the monetary coefficient is an assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Plate, sheet and strip offerings support a distinct flat-product allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire availability supports the material-form crosswalk without establishing revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Tubing availability supports the material-form crosswalk without establishing revenue.
12. DPC Holdings Limited - Registration Statement with 2025 Financial Statements
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing separates ingots from component sales and describes external supply and xx.xx% internal superalloy sourcing, contradicting the inherited xx.xx% captive parameter.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.

13. Acerinox - Results FY 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned US long-product expansion supports the relative conventional-long-material premise; investment is not recognized as sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately USD xx.xx of planned platform investment includes expansion of the long-products offering, informing the bars forecast premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace demand and planned long-product diversification support testing a relative mix shift without assuming flat-product contraction.
14. Haynes International - HAYNES 282
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Powder is offered alongside conventional forms for HAYNES xx.xx supporting nonexclusive form classification, not an observed sales allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification.
      ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification.
      ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))

15. CMA - Anticipated Acquisition of Haynes International by Acerinox: Full Text Decision
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct customer evidence in paragraphs xx.xx-xx.xx supports separate flat/long purchasing pools; no published market-share table is used.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Shape-specific purchasing supports a distinct long-stock allocation model without proving a separate competitive market for billet.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
16. Haynes International - HAYNES 230
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))

17. Carpenter Technology - Advanced Materials for Aerospace Motor & Engines

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation.
([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation.
([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))

18. Elementum 3D - Metal Alloy Additive Manufacturing Colorado

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed.
([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed.
([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))

19. NASA - NASA-Developed Printable Metal Can Take the Heat

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake.
([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake.
([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

20. Carpenter Technology - Lighter, Faster, Stronger Metallurgy for Defense, July 2025

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

21. Special Metals - Aerospace
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy xx.xx; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy X-xx.xx; no current sales quantity is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Waspaloy; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

22. Boeing - BDS Terms and Conditions Guide, D607 Material Substitution Prohibition, November 15, 2013

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: D607 prohibits unauthorized material substitutions while recognizing specified alternatives. It constrains assumptions about frictionless cross-class substitution, without quantifying adoption delays. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization requirements qualify assumptions about precipitation-family substitution opportunities; the clause does not prove future purchases or a class-growth premium. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause prohibits unauthorized substitutions where contractually applicable. It constrains the adoption interpretation but does not establish approval prevalence or a numerical adoption rate. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific material authorization is a counterweight to treating a named offering as immediately substitutable production material. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization limits interpretation of the assumed adoption multiplier; it does not directly establish powder sales. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))

23. Precision Castparts Corp. - Fiscal 2015 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
24. NASA - Chapter 2: Aerospace Materials Characteristics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

25. ESA - ESA Space Environment Report 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
26. NASA and Superalloys: A Customer, a Participant, and a Referee
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
27. VDM Metals - Alloys for the Aerospace Industry
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
28. Carpenter Technology - Business Segments
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))

29. Howmet Aerospace - 2025 Annual Report, Letter to Shareholders

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% combined aerospace and gas-turbine spares revenue constrains the distinction between initial-production and spare-component activity; material and destination adjustments remain modeled. ([howmet.com](https://www.howmet.com/annualreport/))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed combined spares proportion supplies the replacement proxy; approximately xx.xx% commercial aerospace engine-spares growth is historical counterevidence against assuming weak aftermarket activity. ([howmet.com](https://www.howmet.com/annualreport/))

30. GE Aerospace - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment and services costs provide commercial budget anchors for the common material-value denominator; assumed eligible-material fractions prevent full equipment or service value from entering the allocation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Services include spare parts and maintenance activity, supporting an explicit new-article versus restoration attribution rather than equating services revenue with replacement-material purchases. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported USD xx.xx services cost anchors the restoration-material bridge; the restoration allocation and direct eligible-material fraction are assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Total funded R&D of USD xx.xx supplies a development-budget proxy, not observed nickel-material purchasing; only an assumed eligible-material fraction is used. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.

31. Rolls-Royce Holdings Plc - 2025 Full Year Results

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2028 shop-visit target is below the reported 2025 total despite prospective fleet growth, qualifying any automatic conversion of fleet expansion into proportionate maintenance-material purchasing.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The divergence between 2025 engine deliveries and shop visits independently challenges a uniform new-engine-led material forecast; no service revenue is included in the numerator.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Observed engine-delivery and shop-visit activity supports separate new-program and replacement-demand assumptions, not a proportional material-purchase conversion.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

32. UKRI - Accelerating Manufacturing Readiness level of ABD-1000AM for AM of high temperature aerospace components (AMRAM1000)

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The Alloyed-led project has xx.xx of funding and an April 2025-October 2026 funded period. This independently establishes bounded development activity, not annual material sales or recurring production purchases. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))

33. Safran - FY 2025 Results and Investor Update, February 13, 2026

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))

34. Airbus - Full-Year 2025 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 deliveries by aircraft family provide the starting activity comparison for the initial-production forecast; aircraft delivery value is not included in the material numerator. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx% decline in 2025 self-financed R&D is counterevidence to uniform development-budget acceleration and supports a restrained, explicitly assumed development-purchasing scenario. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.

35. Airbus - Half-Year 2026 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 update retained the A320-family, A350 and other production-rate targets, providing a dated commercial constraint on the initial-production activity scenario rather than proof of future material orders. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: First-half 2026 self-financed R&D of EUR xx.xx versus EUR xx.xx provides a modest-growth countercheck for the assumed development-project activity path; the budget is not material-market revenue. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))

36. RTX Corporation - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

37. Federal Reserve Bank of St. Louis - Annual USD/GBP Exchange Rate, AEXUSUK

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))

38. L3Harris Technologies, Inc. - Fiscal 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))

39. FAA Aerospace Forecast Fiscal Years 2025-2045 - Commercial Space

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated official low/high scenarios provide FY2032 licensed launch/reentry activity bounds. Their U.S.-licensed scope and treatment of reusable vehicles prevent direct conversion into Global material revenue. ([faa.gov](https://www.faa.gov/data_research/aviation/aerospace_forecasts/2025-commercial-space.pdf))

40. ICAO - Convention on International Civil Aviation, Ninth Edition

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))

41. DFARS 252.225-7009 - Restriction on Acquisition of Certain Articles Containing Specialty Metals
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
42. Aubert & Duval - Space Industry Metallurgical Solutions
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
43. Aubert & Duval - Metallurgical Solutions for the Defense Industry, June 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
44. Berkshire Hathaway Inc. - 2025 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.

45. Lufthansa Group Annual Report 2025 - MRO business segment
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
46. Oliver Wyman - Global Fleet And MRO Market Forecast 2026-2036: Key Trends
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
47. German Aerospace Center (DLR) - Financing
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
48. Federal Aviation Administration - Parts Manufacturer Approval (PMA): Design Approval
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.

49. Rolled Alloys - E-Services Stocking Programs
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
50. Boeing BDS Terms and Conditions Guide - D604 Raw Material Risk Mitigation
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
51. Carpenter Technology Corporation - Second Quarter Fiscal 2026 Earnings Call Presentation, January 29, 2026
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation distinguishes specialized non-LTA business from a conventional spot market, countering automatic classification of transactional sales as stock.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Three additional aerospace LTAs and xx.xx% sequential commercial-aerospace bookings growth inform the reservation hypothesis, but do not measure its modeled magnitude.
52. Precision Castparts Corp. - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.

53. Howmet Aerospace - United States Locations
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
54. ATI Inc. - 2024 Annual Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New sales commitments through 2040, including amounts expected during the remainder of the decade and predominantly involving jet-engine nickel alloys, inform the direct-program forecast premise without being counted as realized sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% of fiscal-2024 plate volume went to independent service centers, providing a historical comparison that cautions against assuming generalized intermediary displacement.
55. Alloyed - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.

56. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 aerospace realization and revenue provide the common monetary calibration for this modeled grade; neither is a grade-specific sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace material realization supplies a price-scale input, with modeled year and product-mix adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization calibrates the assumed blended material price, not this grade's observed revenue. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace realization provides a shared monetary comparison for the assumed grade price. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported eight-to-ten-year aerospace application-introduction periods constrain interpretation of the seven-year adoption forecast. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace application-introduction periods provide an adoption-delay counterweight, not a forecast sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
57. European Commission CORDIS - Welding Metallurgy and Cracking in Superalloys: Reporting
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical all-sector tonnage discussion is only a dominance cross-check; it cannot establish current aerospace monetary share. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies 718Plus separately from ordinary xx.xx supporting identity separation without supplying a current sales weight. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
58. Special Metals - Alloy Surcharge Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: August-October 2026 grade surcharges provide a differentiated cost-exposure check, not full invoice prices or observed 2032 prices. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx surcharge sequence independently qualifies a uniform price assumption; it is not substituted for a material selling price. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The grade-specific surcharge listing is a commercial cost comparison, not an observed Global grade realization. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))

59. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current-and-past supplier identity mapping only; not proof of 2025 aerospace sales or the modeled volume. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: CMSX-xx.xx is separately identified; the material-value weight remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current sales are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713C is listed separately from IN-713LC; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713LC is listed separately from IN-713C; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx identity mapping only; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-738LC is separately identified; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current aerospace tonnes are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx appears in a current-and-past identification list; this does not establish recurring aerospace production sales. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: MAR-M xx.xx is identified separately from CM247LC; monetary weights remain modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PWA xx.xx is separately identified; no attributable sales value is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; current commercial scale remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; no current grade-specific material sales are disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Udimet xx.xx appears in the supplier's current-and-past identities; aerospace attribution is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

60. GE Aerospace - Safety First: A Retiring GE Aerospace Materials Engineer Made Protecting Lives His Mission
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
61. Aubert & Duval - AD730: Ni-Based Superalloy for High Temperature Applications
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
62. University of Portsmouth - Improved Creep-Fatigue-Oxidation Resistance in Gas Turbine Disc Materials: REF Impact Case Study
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))

63. Influence of Long Term Exposure in Air on Microstructure, Surface Stability and Mechanical Properties of UDIMET 720LI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The aerospace-industry publication distinguishes conventional Udimet xx.xx from its 720Li derivative; it does not establish a current monetary allocation. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The publication independently supports the 720Li identity and aircraft-engine-disc category, without supplying current sales. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

64. NASA Contractor Report 174639 - Literature Survey on Oxidations and Fatigue Lives at Elevated Temperatures

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical institutional material identification is a legacy-category anchor only; it does not demonstrate current aerospace material sales. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

65. America Makes - 5566.002 Proliferation of Nickel Superalloy Material Datasets for Powder Bed Fusion Additive Manufacturing

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))

66. GE Aerospace - Fourth Quarter 2025 Earnings Presentation

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 commercial-engine delivery growth supplies a near-term demand cross-check, not a grade-specific purchasing or seven-year growth observation. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aggregate commercial and defense delivery growth constrains the commercial-demand scenario without establishing this grade's attributable consumption. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported defense-engine delivery growth is a demand-exposure check only; the PWA xx.xx activity factor remains assumed. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

17.2. G7

Table 341. G7 Nickel-Based Superalloys for Aerospace Market, by Country growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 342. G7 Nickel-Based Superalloys for Aerospace Market Size, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 343. G7 Nickel-Based Superalloys for Aerospace Market Size, by Product Form, 2017-2040 (USD Million)

Product Form	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Bars, Rods and Profiles	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Billets and Forging Stock	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ingots	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Plate, Sheet, Strip and Foil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Powder	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Tubes and Pipes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Wire	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 344. G7 Nickel-Based Superalloys for Aerospace Market Size, by Strengthening Class, 2017-2040 (USD Million)

Strengthening Class	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Dispersion-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Precipitation-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Solid-Solution-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 345. G7 Nickel-Based Superalloys for Aerospace Market Size, by Component Application, 2017-2040 (USD Million)

Component Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Breathing Propulsion & Auxiliary Power	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Systems & Equipment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rocket & Spacecraft Propulsion	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Vehicle Structures & Thermal Protection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 346. G7 Nickel-Based Superalloys for Aerospace Market Size, by Air-Breathing Propulsion & Auxiliary Power, 2017-2040 (USD Million)

Air-Breathing Propulsion & Auxiliary Power	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combustion & Exhaust Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Compressor Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine Structures & Auxiliary Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Blades & Vanes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Disks & Rotor Hardware	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 347. G7 Nickel-Based Superalloys for Aerospace Market Size, by Demand Stage, 2017-2040 (USD Million)

Demand Stage	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Initial Equipment Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Repair, Overhaul & Refurbishment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Replacement & Retrofit Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research, Development & Qualification	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 348. G7 Nickel-Based Superalloys for Aerospace Market Size, by Aerospace End Market, 2017-2040 (USD Million)

Aerospace End Market	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Civil & Nonmilitary State Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Guided Missile Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Military Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Space Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 349. G7 Nickel-Based Superalloys for Aerospace Market Size, by Buyer Function, 2017-2040 (USD Million)

Buyer Function	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Aerospace Vehicle Manufacturers & Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Component & Subassembly Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine & Propulsion-System Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Maintenance, Repair & Overhaul Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Development Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 350. G7 Nickel-Based Superalloys for Aerospace Market Size, by Fulfillment Model, 2017-2040 (USD Million)

Fulfillment Model	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Order-Dedicated Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stock Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 351. G7 Nickel-Based Superalloys for Aerospace Market Size, by Supply Channel, 2017-2040 (USD Million)

Supply Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Captive Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent Intermediary Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Producer-Direct Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 352. G7 Nickel-Based Superalloys for Aerospace Market Size, by Alloy Grade, 2017-2040 (USD Million)

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ABD-1000AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
ABD-900AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 352 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
AD730	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy 718Plus	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy X-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CM247LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CMSX-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hastelloy X	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713C	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-738LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
MAR-M xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic 80A	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene 88DT	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 352 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
RR1000	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet 720Li	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Waspaloy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. ATI Inc. - 2025 Form 10-K

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC's reported financial/product-category inputs and listed ingot offering constrain the eligible material envelope; the ingot allocation remains assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: AA&S sales of USD xx.xx and its xx.xx% nickel-based/specialty-alloy category anchor the separately adjusted rolled-material envelope.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial jet-engine revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025, supporting purchasing recovery but not identifying price growth or a 2032 material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))

2. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
3. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Narrow-strip supply supports a limited flat-product allocation within the modeled eligible Carpenter envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire is a disclosed supplied form; its eligible monetary weight remains modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.

4. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical xx.xx% slab/bar/billet revenue category constrains the long-stock proxy; its eligible billet split is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported combined stock category provides a proxy anchor, not a separately disclosed bar revenue share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 flat products represented approximately xx.xx% of net product revenue; extrapolation to the eligible Acerinox envelope is modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 wire represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 tubulars represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical product revenue, channel mix and backlog conversion anchor the modeled stock value weight, with explicit scope adjustments.

5. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Casting-alloy activities support an ingot-material equivalent rather than attributing full engine-component revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed metal/billet activities support retaining a forging-stock allocation; the assumed xx.xx% weight is not reported.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported 2025 sales of USD xx.xx and Engine Products aerospace revenues of USD xx.xx commercial and USD xx.xx defense establish the component-cohort scale; USD xx.xx gas-turbine revenue is excluded through an explicit attribution model. These are not material-market revenues. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The segment/end-market revenue table supplies the aerospace and gas-turbine boundaries needed to bridge combined spares activity into an aerospace replacement-material proxy. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial aerospace represented xx.xx% of 2025 company sales, supplying an independent downstream mix comparison rather than a nickel-material allocation weight. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense aerospace represented xx.xx% of 2025 company sales; the paired commercial/defense comparison tests the aviation model while retaining component and material-scope differences. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.

6. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: GE describes repaired/serviceable-part reuse, supporting a counterforce to converting aftermarket activity directly into newly supplied material purchases. Its reported approximately xx.xx% strategic-nickel revert content is not deducted from the terminal-material market. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Commercial repair and component reuse support retaining uncertainty around replacement-related combustion material purchases. The selected procurement-intensity offset remains an assumption, not a measured avoided-purchase percentage. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
7. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
8. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.

9. Special Metals - Tech Center
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised ingot supply establishes a PCC material-form crosswalk, not its sales weight.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised billet supply supports the forging-stock category mapping within the inherited PCC envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised bar supply supports classification only; the monetary coefficient is an assumption.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Plate, sheet and strip offerings support a distinct flat-product allocation premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire availability supports the material-form crosswalk without establishing revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Tubing availability supports the material-form crosswalk without establishing revenue.
10. DPC Holdings Limited - Registration Statement with 2025 Financial Statements
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing separates ingots from component sales and describes external supply and xx.xx% internal superalloy sourcing, contradicting the inherited xx.xx% captive parameter.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
11. Acerinox - Results FY 2025
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned US long-product expansion supports the relative conventional-long-material premise; investment is not recognized as sales.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately USD xx.xx of planned platform investment includes expansion of the long-products offering, informing the bars forecast premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace demand and planned long-product diversification support testing a relative mix shift without assuming flat-product contraction.

12. Haynes International - HAYNES 282
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Powder is offered alongside conventional forms for HAYNES xx.xx supporting nonexclusive form classification, not an observed sales allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
13. CMA - Anticipated Acquisition of Haynes International by Acerinox: Full Text Decision
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct customer evidence in paragraphs xx.xx-xx.xx supports separate flat/long purchasing pools; no published market-share table is used.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Shape-specific purchasing supports a distinct long-stock allocation model without proving a separate competitive market for billet.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.

14. Haynes International - HAYNES 230
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
15. Carpenter Technology - Advanced Materials for Aerospace Motor & Engines
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))
16. Elementum 3D - Metal Alloy Additive Manufacturing Colorado
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed. ([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed. ([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))
17. NASA - NASA-Developed Printable Metal Can Take the Heat
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake. ([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake. ([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

18. Carpenter Technology - Lighter, Faster, Stronger Metallurgy for Defense, July 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights. ([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights. ([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))
19. Special Metals - Aerospace
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy xx.xx; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy X-xx.xx; no current sales quantity is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Waspaloy; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

20. Boeing - BDS Terms and Conditions Guide, D607 Material Substitution Prohibition, November 15, 2013
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: D607 prohibits unauthorized material substitutions while recognizing specified alternatives. It constrains assumptions about frictionless cross-class substitution, without quantifying adoption delays. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization requirements qualify assumptions about precipitation-family substitution opportunities; the clause does not prove future purchases or a class-growth premium. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause prohibits unauthorized substitutions where contractually applicable. It constrains the adoption interpretation but does not establish approval prevalence or a numerical adoption rate. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific material authorization is a counterweight to treating a named offering as immediately substitutable production material. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization limits interpretation of the assumed adoption multiplier; it does not directly establish powder sales. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))

21. Precision Castparts Corp. - Fiscal 2015 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
22. NASA - Chapter 2: Aerospace Materials Characteristics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

23. ESA - ESA Space Environment Report 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
24. NASA and Superalloys: A Customer, a Participant, and a Referee
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
25. VDM Metals - Alloys for the Aerospace Industry
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
26. Carpenter Technology - Business Segments
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))

27. Howmet Aerospace - 2025 Annual Report, Letter to Shareholders

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% combined aerospace and gas-turbine spares revenue constrains the distinction between initial-production and spare-component activity; material and destination adjustments remain modeled. ([howmet.com](https://www.howmet.com/annualreport/))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed combined spares proportion supplies the replacement proxy; approximately xx.xx% commercial aerospace engine-spares growth is historical counterevidence against assuming weak aftermarket activity. ([howmet.com](https://www.howmet.com/annualreport/))

28. GE Aerospace - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment and services costs provide commercial budget anchors for the common material-value denominator; assumed eligible-material fractions prevent full equipment or service value from entering the allocation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Services include spare parts and maintenance activity, supporting an explicit new-article versus restoration attribution rather than equating services revenue with replacement-material purchases. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported USD xx.xx services cost anchors the restoration-material bridge; the restoration allocation and direct eligible-material fraction are assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Total funded R&D of USD xx.xx supplies a development-budget proxy, not observed nickel-material purchasing; only an assumed eligible-material fraction is used. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.

29. Rolls-Royce Holdings Plc - 2025 Full Year Results

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2028 shop-visit target is below the reported 2025 total despite prospective fleet growth, qualifying any automatic conversion of fleet expansion into proportionate maintenance-material purchasing.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The divergence between 2025 engine deliveries and shop visits independently challenges a uniform new-engine-led material forecast; no service revenue is included in the numerator.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Observed engine-delivery and shop-visit activity supports separate new-program and replacement-demand assumptions, not a proportional material-purchase conversion.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

30. UKRI - Accelerating Manufacturing Readiness level of ABD-1000AM for AM of high temperature aerospace components (AMRAM1000)
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The Alloyed-led project has xx.xx of funding and an April 2025-October 2026 funded period. This independently establishes bounded development activity, not annual material sales or recurring production purchases. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
31. Safran - FY 2025 Results and Investor Update, February 13, 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))

32. Airbus - Full-Year 2025 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 deliveries by aircraft family provide the starting activity comparison for the initial-production forecast; aircraft delivery value is not included in the material numerator. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx% decline in 2025 self-financed R&D is counterevidence to uniform development-budget acceleration and supports a restrained, explicitly assumed development-purchasing scenario. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.

33. Airbus - Half-Year 2026 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 update retained the A320-family, A350 and other production-rate targets, providing a dated commercial constraint on the initial-production activity scenario rather than proof of future material orders. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: First-half 2026 self-financed R&D of EUR xx.xx versus EUR xx.xx provides a modest-growth countercheck for the assumed development-project activity path; the budget is not material-market revenue. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))

34. RTX Corporation - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

35. Federal Reserve Bank of St. Louis - Annual USD/GBP Exchange Rate, AEXUSUK
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
36. L3Harris Technologies, Inc. - Fiscal 2025 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
37. FAA Aerospace Forecast Fiscal Years 2025-2045 - Commercial Space
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated official low/high scenarios provide FY2032 licensed launch/reentry activity bounds. Their U.S.-licensed scope and treatment of reusable vehicles prevent direct conversion into Global material revenue. ([faa.gov](https://www.faa.gov/data_research/aviation/aerospace_forecasts/2025-commercial-space.pdf))
38. ICAO - Convention on International Civil Aviation, Ninth Edition
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))

39. DFARS 252.225-7009 - Restriction on Acquisition of Certain Articles Containing Specialty Metals
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
40. Aubert & Duval - Space Industry Metallurgical Solutions
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
41. Aubert & Duval - Metallurgical Solutions for the Defense Industry, June 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
42. Berkshire Hathaway Inc. - 2025 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.

43. Lufthansa Group Annual Report 2025 - MRO business segment
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
44. Oliver Wyman - Global Fleet And MRO Market Forecast 2026-2036: Key Trends
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
45. German Aerospace Center (DLR) - Financing
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
46. Federal Aviation Administration - Parts Manufacturer Approval (PMA): Design Approval
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.

47. Rolled Alloys - E-Services Stocking Programs
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
48. Boeing BDS Terms and Conditions Guide - D604 Raw Material Risk Mitigation
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
49. Carpenter Technology Corporation - Second Quarter Fiscal 2026 Earnings Call Presentation, January 29, 2026
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation distinguishes specialized non-LTA business from a conventional spot market, countering automatic classification of transactional sales as stock.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Three additional aerospace LTAs and xx.xx% sequential commercial-aerospace bookings growth inform the reservation hypothesis, but do not measure its modeled magnitude.
50. Precision Castparts Corp. - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.

51. Howmet Aerospace - United States Locations
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.

52. ATI Inc. - 2024 Annual Report
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New sales commitments through 2040, including amounts expected during the remainder of the decade and predominantly involving jet-engine nickel alloys, inform the direct-program forecast premise without being counted as realized sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% of fiscal-2024 plate volume went to independent service centers, providing a historical comparison that cautions against assuming generalized intermediary displacement.

53. Alloyed - About
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.

54. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 aerospace realization and revenue provide the common monetary calibration for this modeled grade; neither is a grade-specific sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace material realization supplies a price-scale input, with modeled year and product-mix adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization calibrates the assumed blended material price, not this grade's observed revenue. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace realization provides a shared monetary comparison for the assumed grade price. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported eight-to-ten-year aerospace application-introduction periods constrain interpretation of the seven-year adoption forecast. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace application-introduction periods provide an adoption-delay counterweight, not a forecast sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
55. European Commission CORDIS - Welding Metallurgy and Cracking in Superalloys: Reporting
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical all-sector tonnage discussion is only a dominance cross-check; it cannot establish current aerospace monetary share. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies 718Plus separately from ordinary xx.xx supporting identity separation without supplying a current sales weight. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
56. Special Metals - Alloy Surcharge Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: August-October 2026 grade surcharges provide a differentiated cost-exposure check, not full invoice prices or observed 2032 prices. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx surcharge sequence independently qualifies a uniform price assumption; it is not substituted for a material selling price. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The grade-specific surcharge listing is a commercial cost comparison, not an observed Global grade realization. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))

57. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current-and-past supplier identity mapping only; not proof of 2025 aerospace sales or the modeled volume. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: CMSX-xx.xx is separately identified; the material-value weight remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current sales are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713C is listed separately from IN-713LC; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713LC is listed separately from IN-713C; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx identity mapping only; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-738LC is separately identified; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current aerospace tonnes are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx appears in a current-and-past identification list; this does not establish recurring aerospace production sales. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: MAR-M xx.xx is identified separately from CM247LC; monetary weights remain modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PWA xx.xx is separately identified; no attributable sales value is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; current commercial scale remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; no current grade-specific material sales are disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Udimet xx.xx appears in the supplier's current-and-past identities; aerospace attribution is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

58. GE Aerospace - Safety First: A Retiring GE Aerospace Materials Engineer Made Protecting Lives His Mission
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
59. Aubert & Duval - AD730: Ni-Based Superalloy for High Temperature Applications
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
60. University of Portsmouth - Improved Creep-Fatigue-Oxidation Resistance in Gas Turbine Disc Materials: REF Impact Case Study
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))

61. Influence of Long Term Exposure in Air on Microstructure, Surface Stability and Mechanical Properties of UDIMET 720LI

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The aerospace-industry publication distinguishes conventional Udimet xx.xx from its 720Li derivative; it does not establish a current monetary allocation. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The publication independently supports the 720Li identity and aircraft-engine-disc category, without supplying current sales. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

62. NASA Contractor Report 174639 - Literature Survey on Oxidations and Fatigue Lives at Elevated Temperatures

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical institutional material identification is a legacy-category anchor only; it does not demonstrate current aerospace material sales. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

63. America Makes - 5566.002 Proliferation of Nickel Superalloy Material Datasets for Powder Bed Fusion Additive Manufacturing

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))

64. GE Aerospace - Fourth Quarter 2025 Earnings Presentation

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 commercial-engine delivery growth supplies a near-term demand cross-check, not a grade-specific purchasing or seven-year growth observation. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aggregate commercial and defense delivery growth constrains the commercial-demand scenario without establishing this grade's attributable consumption. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported defense-engine delivery growth is a demand-exposure check only; the PWA xx.xx activity factor remains assumed. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

17.3. European Union

Table 353. European Union Nickel-Based Superalloys for Aerospace Market, by Country growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Austria	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Belgium	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Bulgaria	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Croatia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Cyprus	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Czech Republic	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Denmark	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Estonia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Finland	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Greece	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hungary	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ireland	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latvia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Lithuania	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Luxembourg	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Malta	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Netherlands	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Poland	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Portugal	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Romania	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Slovakia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Slovenia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Sweden	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 354. European Union Nickel-Based Superalloys for Aerospace Market Size, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Austria	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Belgium	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Bulgaria	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Croatia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Cyprus	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Czech Republic	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Denmark	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Estonia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Finland	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Greece	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hungary	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ireland	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latvia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Lithuania	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Luxembourg	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Malta	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Netherlands	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Poland	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Portugal	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Romania	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Slovakia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Slovenia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Sweden	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 355. European Union Nickel-Based Superalloys for Aerospace Market Size, by Product Form, 2017-2040 (USD Million)

Product Form	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Bars, Rods and Profiles	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Billets and Forging Stock	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ingots	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Plate, Sheet, Strip and Foil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Powder	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Tubes and Pipes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Wire	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 356. European Union Nickel-Based Superalloys for Aerospace Market Size, by Strengthening Class, 2017-2040 (USD Million)

Strengthening Class	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Dispersion-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Precipitation-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Solid-Solution-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 357. European Union Nickel-Based Superalloys for Aerospace Market Size, by Component Application, 2017-2040 (USD Million)

Component Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Breathing Propulsion & Auxiliary Power	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Systems & Equipment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rocket & Spacecraft Propulsion	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Vehicle Structures & Thermal Protection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 358. European Union Nickel-Based Superalloys for Aerospace Market Size, by Air-Breathing Propulsion & Auxiliary Power, 2017-2040 (USD Million)

Air-Breathing Propulsion & Auxiliary Power	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combustion & Exhaust Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Compressor Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine Structures & Auxiliary Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Blades & Vanes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Disks & Rotor Hardware	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 359. European Union Nickel-Based Superalloys for Aerospace Market Size, by Demand Stage, 2017-2040 (USD Million)

Demand Stage	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Initial Equipment Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Repair, Overhaul & Refurbishment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Replacement & Retrofit Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research, Development & Qualification	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 360. European Union Nickel-Based Superalloys for Aerospace Market Size, by Aerospace End Market, 2017-2040 (USD Million)

Aerospace End Market	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Civil & Nonmilitary State Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Guided Missile Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Military Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Space Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 361. European Union Nickel-Based Superalloys for Aerospace Market Size, by Buyer Function, 2017-2040 (USD Million)

Buyer Function	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Aerospace Vehicle Manufacturers & Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Component & Subassembly Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine & Propulsion-System Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Maintenance, Repair & Overhaul Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Development Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 362. European Union Nickel-Based Superalloys for Aerospace Market Size, by Fulfillment Model, 2017-2040 (USD Million)

Fulfillment Model	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Order-Dedicated Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stock Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 363. European Union Nickel-Based Superalloys for Aerospace Market Size, by Supply Channel, 2017-2040 (USD Million)

Supply Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Captive Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent Intermediary Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Producer-Direct Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 364. European Union Nickel-Based Superalloys for Aerospace Market Size, by Alloy Grade, 2017-2040 (USD Million)

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ABD-1000AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
ABD-900AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 364 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
AD730	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy 718Plus	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy X-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CM247LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CMSX-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hastelloy X	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713C	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-738LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
MAR-M xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic 80A	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene 88DT	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

RESEARCH SAMPLE REPORT

Table 364 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
RR1000	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet 720Li	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Waspaloy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. ATI Inc. - 2025 Form 10-K

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC's reported financial/product-category inputs and listed ingot offering constrain the eligible material envelope; the ingot allocation remains assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: AA&S sales of USD xx.xx and its xx.xx% nickel-based/specialty-alloy category anchor the separately adjusted rolled-material envelope.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial jet-engine revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025, supporting purchasing recovery but not identifying price growth or a 2032 material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))

2. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
3. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Narrow-strip supply supports a limited flat-product allocation within the modeled eligible Carpenter envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire is a disclosed supplied form; its eligible monetary weight remains modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.

4. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical xx.xx% slab/bar/billet revenue category constrains the long-stock proxy; its eligible billet split is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported combined stock category provides a proxy anchor, not a separately disclosed bar revenue share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 flat products represented approximately xx.xx% of net product revenue; extrapolation to the eligible Acerinox envelope is modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 wire represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 tubulars represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical product revenue, channel mix and backlog conversion anchor the modeled stock value weight, with explicit scope adjustments.

5. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Casting-alloy activities support an ingot-material equivalent rather than attributing full engine-component revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed metal/billet activities support retaining a forging-stock allocation; the assumed xx.xx% weight is not reported.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported 2025 sales of USD xx.xx and Engine Products aerospace revenues of USD xx.xx commercial and USD xx.xx defense establish the component-cohort scale; USD xx.xx gas-turbine revenue is excluded through an explicit attribution model. These are not material-market revenues. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The segment/end-market revenue table supplies the aerospace and gas-turbine boundaries needed to bridge combined spares activity into an aerospace replacement-material proxy. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial aerospace represented xx.xx% of 2025 company sales, supplying an independent downstream mix comparison rather than a nickel-material allocation weight. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense aerospace represented xx.xx% of 2025 company sales; the paired commercial/defense comparison tests the aviation model while retaining component and material-scope differences. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.

6. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: GE describes repaired/serviceable-part reuse, supporting a counterforce to converting aftermarket activity directly into newly supplied material purchases. Its reported approximately xx.xx% strategic-nickel revert content is not deducted from the terminal-material market. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Commercial repair and component reuse support retaining uncertainty around replacement-related combustion material purchases. The selected procurement-intensity offset remains an assumption, not a measured avoided-purchase percentage. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
7. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Austria input requires a substantial non-aerospace mix adjustment.
8. Special Metals - Tech Center
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised ingot supply establishes a PCC material-form crosswalk, not its sales weight.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised billet supply supports the forging-stock category mapping within the inherited PCC envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised bar supply supports classification only; the monetary coefficient is an assumption.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Plate, sheet and strip offerings support a distinct flat-product allocation premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire availability supports the material-form crosswalk without establishing revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Tubing availability supports the material-form crosswalk without establishing revenue.

9. DPC Holdings Limited - Registration Statement with 2025 Financial Statements
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing separates ingots from component sales and describes external supply and xx.xx% internal superalloy sourcing, contradicting the inherited xx.xx% captive parameter.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
10. Acerinox - Results FY 2025
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned US long-product expansion supports the relative conventional-long-material premise; investment is not recognized as sales.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately USD xx.xx of planned platform investment includes expansion of the long-products offering, informing the bars forecast premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace demand and planned long-product diversification support testing a relative mix shift without assuming flat-product contraction.
11. Haynes International - HAYNES 282
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Powder is offered alongside conventional forms for HAYNES xx.xx supporting nonexclusive form classification, not an observed sales allocation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))

12. CMA - Anticipated Acquisition of Haynes International by Acerinox: Full Text Decision
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct customer evidence in paragraphs xx.xx-xx.xx supports separate flat/long purchasing pools; no published market-share table is used.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Shape-specific purchasing supports a distinct long-stock allocation model without proving a separate competitive market for billet.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
13. Haynes International - HAYNES 230
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))

14. Carpenter Technology - Advanced Materials for Aerospace Motor & Engines

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation.
([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation.
([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))

15. Elementum 3D - Metal Alloy Additive Manufacturing Colorado

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed.
([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed.
([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))

16. NASA - NASA-Developed Printable Metal Can Take the Heat

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake.
([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake.
([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

17. Carpenter Technology - Lighter, Faster, Stronger Metallurgy for Defense, July 2025

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

18. Special Metals - Aerospace
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy xx.xx; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy X-xx.xx; no current sales quantity is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Waspaloy; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

19. Boeing - BDS Terms and Conditions Guide, D607 Material Substitution Prohibition, November 15, 2013
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: D607 prohibits unauthorized material substitutions while recognizing specified alternatives. It constrains assumptions about frictionless cross-class substitution, without quantifying adoption delays. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization requirements qualify assumptions about precipitation-family substitution opportunities; the clause does not prove future purchases or a class-growth premium. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause prohibits unauthorized substitutions where contractually applicable. It constrains the adoption interpretation but does not establish approval prevalence or a numerical adoption rate. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific material authorization is a counterweight to treating a named offering as immediately substitutable production material. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization limits interpretation of the assumed adoption multiplier; it does not directly establish powder sales. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))

20. Precision Castparts Corp. - Fiscal 2015 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
21. NASA - Chapter 2: Aerospace Materials Characteristics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

22. ESA - ESA Space Environment Report 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
23. NASA and Superalloys: A Customer, a Participant, and a Referee
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
24. VDM Metals - Alloys for the Aerospace Industry
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
25. Carpenter Technology - Business Segments
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))

26. Howmet Aerospace - 2025 Annual Report, Letter to Shareholders

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% combined aerospace and gas-turbine spares revenue constrains the distinction between initial-production and spare-component activity; material and destination adjustments remain modeled. ([howmet.com](https://www.howmet.com/annualreport/))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed combined spares proportion supplies the replacement proxy; approximately xx.xx% commercial aerospace engine-spares growth is historical counterevidence against assuming weak aftermarket activity. ([howmet.com](https://www.howmet.com/annualreport/))

27. GE Aerospace - 2025 Form 10-K

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment and services costs provide commercial budget anchors for the common material-value denominator; assumed eligible-material fractions prevent full equipment or service value from entering the allocation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Services include spare parts and maintenance activity, supporting an explicit new-article versus restoration attribution rather than equating services revenue with replacement-material purchases. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported USD xx.xx services cost anchors the restoration-material bridge; the restoration allocation and direct eligible-material fraction are assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Total funded R&D of USD xx.xx supplies a development-budget proxy, not observed nickel-material purchasing; only an assumed eligible-material fraction is used. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.

28. Rolls-Royce Holdings Plc - 2025 Full Year Results

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2028 shop-visit target is below the reported 2025 total despite prospective fleet growth, qualifying any automatic conversion of fleet expansion into proportionate maintenance-material purchasing.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The divergence between 2025 engine deliveries and shop visits independently challenges a uniform new-engine-led material forecast; no service revenue is included in the numerator.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Observed engine-delivery and shop-visit activity supports separate new-program and replacement-demand assumptions, not a proportional material-purchase conversion.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

29. UKRI - Accelerating Manufacturing Readiness level of ABD-1000AM for AM of high temperature aerospace components (AMRAM1000)
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The Alloyed-led project has xx.xx of funding and an April 2025-October 2026 funded period. This independently establishes bounded development activity, not annual material sales or recurring production purchases. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
30. Safran - FY 2025 Results and Investor Update, February 13, 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))

31. Airbus - Full-Year 2025 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 deliveries by aircraft family provide the starting activity comparison for the initial-production forecast; aircraft delivery value is not included in the material numerator. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx% decline in 2025 self-financed R&D is counterevidence to uniform development-budget acceleration and supports a restrained, explicitly assumed development-purchasing scenario. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.

32. Airbus - Half-Year 2026 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 update retained the A320-family, A350 and other production-rate targets, providing a dated commercial constraint on the initial-production activity scenario rather than proof of future material orders. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: First-half 2026 self-financed R&D of EUR xx.xx versus EUR xx.xx provides a modest-growth countercheck for the assumed development-project activity path; the budget is not material-market revenue. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))

33. RTX Corporation - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

34. Federal Reserve Bank of St. Louis - Annual USD/GBP Exchange Rate, AEXUSUK
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
35. L3Harris Technologies, Inc. - Fiscal 2025 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
36. FAA Aerospace Forecast Fiscal Years 2025-2045 - Commercial Space
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated official low/high scenarios provide FY2032 licensed launch/reentry activity bounds. Their U.S.-licensed scope and treatment of reusable vehicles prevent direct conversion into Global material revenue. ([faa.gov](https://www.faa.gov/data_research/aviation/aerospace_forecasts/2025-commercial-space.pdf))
37. ICAO - Convention on International Civil Aviation, Ninth Edition
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))

38. DFARS 252.225-7009 - Restriction on Acquisition of Certain Articles Containing Specialty Metals
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
39. Aubert & Duval - Space Industry Metallurgical Solutions
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
40. Aubert & Duval - Metallurgical Solutions for the Defense Industry, June 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
41. Berkshire Hathaway Inc. - 2025 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.

42. Lufthansa Group Annual Report 2025 - MRO business segment
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
43. Oliver Wyman - Global Fleet And MRO Market Forecast 2026-2036: Key Trends
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
44. German Aerospace Center (DLR) - Financing
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
45. Federal Aviation Administration - Parts Manufacturer Approval (PMA): Design Approval
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.

46. Rolled Alloys - E-Services Stocking Programs
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
47. Boeing BDS Terms and Conditions Guide - D604 Raw Material Risk Mitigation
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
48. Carpenter Technology Corporation - Second Quarter Fiscal 2026 Earnings Call Presentation, January 29, 2026
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation distinguishes specialized non-LTA business from a conventional spot market, countering automatic classification of transactional sales as stock.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Three additional aerospace LTAs and xx.xx% sequential commercial-aerospace bookings growth inform the reservation hypothesis, but do not measure its modeled magnitude.
49. Precision Castparts Corp. - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.

50. Howmet Aerospace - United States Locations
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
51. ATI Inc. - 2024 Annual Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New sales commitments through 2040, including amounts expected during the remainder of the decade and predominantly involving jet-engine nickel alloys, inform the direct-program forecast premise without being counted as realized sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% of fiscal-2024 plate volume went to independent service centers, providing a historical comparison that cautions against assuming generalized intermediary displacement.
52. Alloyed - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.

53. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 aerospace realization and revenue provide the common monetary calibration for this modeled grade; neither is a grade-specific sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace material realization supplies a price-scale input, with modeled year and product-mix adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization calibrates the assumed blended material price, not this grade's observed revenue. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace realization provides a shared monetary comparison for the assumed grade price. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported eight-to-ten-year aerospace application-introduction periods constrain interpretation of the seven-year adoption forecast. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace application-introduction periods provide an adoption-delay counterweight, not a forecast sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
54. European Commission CORDIS - Welding Metallurgy and Cracking in Superalloys: Reporting
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical all-sector tonnage discussion is only a dominance cross-check; it cannot establish current aerospace monetary share. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies 718Plus separately from ordinary xx.xx supporting identity separation without supplying a current sales weight. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
55. Special Metals - Alloy Surcharge Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: August-October 2026 grade surcharges provide a differentiated cost-exposure check, not full invoice prices or observed 2032 prices. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx surcharge sequence independently qualifies a uniform price assumption; it is not substituted for a material selling price. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The grade-specific surcharge listing is a commercial cost comparison, not an observed Global grade realization. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))

56. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current-and-past supplier identity mapping only; not proof of 2025 aerospace sales or the modeled volume. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: CMSX-xx.xx is separately identified; the material-value weight remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current sales are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713C is listed separately from IN-713LC; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713LC is listed separately from IN-713C; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx identity mapping only; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-738LC is separately identified; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current aerospace tonnes are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx appears in a current-and-past identification list; this does not establish recurring aerospace production sales. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: MAR-M xx.xx is identified separately from CM247LC; monetary weights remain modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PWA xx.xx is separately identified; no attributable sales value is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; current commercial scale remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; no current grade-specific material sales are disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Udimet xx.xx appears in the supplier's current-and-past identities; aerospace attribution is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

57. GE Aerospace - Safety First: A Retiring GE Aerospace Materials Engineer Made Protecting Lives His Mission
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
58. Aubert & Duval - AD730: Ni-Based Superalloy for High Temperature Applications
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
59. University of Portsmouth - Improved Creep-Fatigue-Oxidation Resistance in Gas Turbine Disc Materials: REF Impact Case Study
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))

60. Influence of Long Term Exposure in Air on Microstructure, Surface Stability and Mechanical Properties of UDIMET 720LI

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The aerospace-industry publication distinguishes conventional Udimet xx.xx from its 720Li derivative; it does not establish a current monetary allocation. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The publication independently supports the 720Li identity and aircraft-engine-disc category, without supplying current sales. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

61. NASA Contractor Report 174639 - Literature Survey on Oxidations and Fatigue Lives at Elevated Temperatures

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical institutional material identification is a legacy-category anchor only; it does not demonstrate current aerospace material sales. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

62. America Makes - 5566.002 Proliferation of Nickel Superalloy Material Datasets for Powder Bed Fusion Additive Manufacturing

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))

63. GE Aerospace - Fourth Quarter 2025 Earnings Presentation

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 commercial-engine delivery growth supplies a near-term demand cross-check, not a grade-specific purchasing or seven-year growth observation. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aggregate commercial and defense delivery growth constrains the commercial-demand scenario without establishing this grade's attributable consumption. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported defense-engine delivery growth is a demand-exposure check only; the PWA xx.xx activity factor remains assumed. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

17.4. BRICS

Table 365. BRICS Nickel-Based Superalloys for Aerospace Market, by Country growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 366. BRICS Nickel-Based Superalloys for Aerospace Market Size, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 367. BRICS Nickel-Based Superalloys for Aerospace Market Size, by Product Form, 2017-2040 (USD Million)

Product Form	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Bars, Rods and Profiles	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Billets and Forging Stock	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ingots	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Plate, Sheet, Strip and Foil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Powder	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Tubes and Pipes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Wire	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 368. BRICS Nickel-Based Superalloys for Aerospace Market Size, by Strengthening Class, 2017-2040 (USD Million)

Strengthening Class	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Dispersion-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Precipitation-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Solid-Solution-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 369. BRICS Nickel-Based Superalloys for Aerospace Market Size, by Component Application, 2017-2040 (USD Million)

Component Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Breathing Propulsion & Auxiliary Power	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Systems & Equipment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rocket & Spacecraft Propulsion	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Vehicle Structures & Thermal Protection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 370. BRICS Nickel-Based Superalloys for Aerospace Market Size, by Air-Breathing Propulsion & Auxiliary Power, 2017-2040 (USD Million)

Air-Breathing Propulsion & Auxiliary Power	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combustion & Exhaust Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Compressor Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine Structures & Auxiliary Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Blades & Vanes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Disks & Rotor Hardware	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 371. BRICS Nickel-Based Superalloys for Aerospace Market Size, by Demand Stage, 2017-2040 (USD Million)

Demand Stage	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Initial Equipment Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Repair, Overhaul & Refurbishment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Replacement & Retrofit Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research, Development & Qualification	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 372. BRICS Nickel-Based Superalloys for Aerospace Market Size, by Aerospace End Market, 2017-2040 (USD Million)

Aerospace End Market	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Civil & Nonmilitary State Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Guided Missile Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Military Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Space Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 373. BRICS Nickel-Based Superalloys for Aerospace Market Size, by Buyer Function, 2017-2040 (USD Million)

Buyer Function	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Aerospace Vehicle Manufacturers & Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Component & Subassembly Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine & Propulsion-System Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Maintenance, Repair & Overhaul Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Development Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 374. BRICS Nickel-Based Superalloys for Aerospace Market Size, by Fulfillment Model, 2017-2040 (USD Million)

Fulfillment Model	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Order-Dedicated Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stock Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 375. BRICS Nickel-Based Superalloys for Aerospace Market Size, by Supply Channel, 2017-2040 (USD Million)

Supply Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Captive Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent Intermediary Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Producer-Direct Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 376. BRICS Nickel-Based Superalloys for Aerospace Market Size, by Alloy Grade, 2017-2040 (USD Million)

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ABD-1000AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
ABD-900AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
AD730	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy 718Plus	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy X-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CM247LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CMSX-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hastelloy X	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713C	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

RESEARCH SAMPLE REPORT

Table 376 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
IN-713LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-738LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
MAR-M xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic 80A	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene 88DT	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
RR1000	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet 720Li	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Waspaloy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. ATI Inc. - 2025 Form 10-K

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC's reported financial/product-category inputs and listed ingot offering constrain the eligible material envelope; the ingot allocation remains assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: AA&S sales of USD xx.xx and its xx.xx% nickel-based/specialty-alloy category anchor the separately adjusted rolled-material envelope.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial jet-engine revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025, supporting purchasing recovery but not identifying price growth or a 2032 material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))

2. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
3. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Narrow-strip supply supports a limited flat-product allocation within the modeled eligible Carpenter envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire is a disclosed supplied form; its eligible monetary weight remains modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.

4. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical xx.xx% slab/bar/billet revenue category constrains the long-stock proxy; its eligible billet split is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported combined stock category provides a proxy anchor, not a separately disclosed bar revenue share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 flat products represented approximately xx.xx% of net product revenue; extrapolation to the eligible Acerinox envelope is modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 wire represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 tubulars represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical product revenue, channel mix and backlog conversion anchor the modeled stock value weight, with explicit scope adjustments.

5. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Casting-alloy activities support an ingot-material equivalent rather than attributing full engine-component revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed metal/billet activities support retaining a forging-stock allocation; the assumed xx.xx% weight is not reported.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported 2025 sales of USD xx.xx and Engine Products aerospace revenues of USD xx.xx commercial and USD xx.xx defense establish the component-cohort scale; USD xx.xx gas-turbine revenue is excluded through an explicit attribution model. These are not material-market revenues. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The segment/end-market revenue table supplies the aerospace and gas-turbine boundaries needed to bridge combined spares activity into an aerospace replacement-material proxy. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial aerospace represented xx.xx% of 2025 company sales, supplying an independent downstream mix comparison rather than a nickel-material allocation weight. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense aerospace represented xx.xx% of 2025 company sales; the paired commercial/defense comparison tests the aviation model while retaining component and material-scope differences. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.

6. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: GE describes repaired/serviceable-part reuse, supporting a counterforce to converting aftermarket activity directly into newly supplied material purchases. Its reported approximately xx.xx% strategic-nickel revert content is not deducted from the terminal-material market. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Commercial repair and component reuse support retaining uncertainty around replacement-related combustion material purchases. The selected procurement-intensity offset remains an assumption, not a measured avoided-purchase percentage. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
7. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
8. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
9. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
10. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

11. Special Metals - Tech Center
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised ingot supply establishes a PCC material-form crosswalk, not its sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised billet supply supports the forging-stock category mapping within the inherited PCC envelope.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised bar supply supports classification only; the monetary coefficient is an assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Plate, sheet and strip offerings support a distinct flat-product allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire availability supports the material-form crosswalk without establishing revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Tubing availability supports the material-form crosswalk without establishing revenue.
12. DPC Holdings Limited - Registration Statement with 2025 Financial Statements
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing separates ingots from component sales and describes external supply and xx.xx% internal superalloy sourcing, contradicting the inherited xx.xx% captive parameter.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
13. Acerinox - Results FY 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned US long-product expansion supports the relative conventional-long-material premise; investment is not recognized as sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately USD xx.xx of planned platform investment includes expansion of the long-products offering, informing the bars forecast premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace demand and planned long-product diversification support testing a relative mix shift without assuming flat-product contraction.

14. Haynes International - HAYNES 282
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Powder is offered alongside conventional forms for HAYNES xx.xx supporting nonexclusive form classification, not an observed sales allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
15. CMA - Anticipated Acquisition of Haynes International by Acerinox: Full Text Decision
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct customer evidence in paragraphs xx.xx-xx.xx supports separate flat/long purchasing pools; no published market-share table is used.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Shape-specific purchasing supports a distinct long-stock allocation model without proving a separate competitive market for billet.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.

16. Haynes International - HAYNES 230
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
17. Carpenter Technology - Advanced Materials for Aerospace Motor & Engines
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))
18. Elementum 3D - Metal Alloy Additive Manufacturing Colorado
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed. ([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed. ([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))
19. NASA - NASA-Developed Printable Metal Can Take the Heat
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake. ([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake. ([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

20. Carpenter Technology - Lighter, Faster, Stronger Metallurgy for Defense, July 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights. ([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights. ([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))
21. Special Metals - Aerospace
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy xx.xx; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy X-xx.xx; no current sales quantity is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Waspaloy; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

22. Boeing - BDS Terms and Conditions Guide, D607 Material Substitution Prohibition, November 15, 2013
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: D607 prohibits unauthorized material substitutions while recognizing specified alternatives. It constrains assumptions about frictionless cross-class substitution, without quantifying adoption delays. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization requirements qualify assumptions about precipitation-family substitution opportunities; the clause does not prove future purchases or a class-growth premium. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause prohibits unauthorized substitutions where contractually applicable. It constrains the adoption interpretation but does not establish approval prevalence or a numerical adoption rate. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific material authorization is a counterweight to treating a named offering as immediately substitutable production material. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization limits interpretation of the assumed adoption multiplier; it does not directly establish powder sales. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))

23. Precision Castparts Corp. - Fiscal 2015 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.

24. NASA - Chapter 2: Aerospace Materials Characteristics

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

25. ESA - ESA Space Environment Report 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
26. NASA and Superalloys: A Customer, a Participant, and a Referee
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
27. VDM Metals - Alloys for the Aerospace Industry
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
28. Carpenter Technology - Business Segments
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))

29. Howmet Aerospace - 2025 Annual Report, Letter to Shareholders

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% combined aerospace and gas-turbine spares revenue constrains the distinction between initial-production and spare-component activity; material and destination adjustments remain modeled. ([howmet.com](https://www.howmet.com/annualreport/))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed combined spares proportion supplies the replacement proxy; approximately xx.xx% commercial aerospace engine-spares growth is historical counterevidence against assuming weak aftermarket activity. ([howmet.com](https://www.howmet.com/annualreport/))

30. GE Aerospace - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment and services costs provide commercial budget anchors for the common material-value denominator; assumed eligible-material fractions prevent full equipment or service value from entering the allocation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Services include spare parts and maintenance activity, supporting an explicit new-article versus restoration attribution rather than equating services revenue with replacement-material purchases. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported USD xx.xx services cost anchors the restoration-material bridge; the restoration allocation and direct eligible-material fraction are assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Total funded R&D of USD xx.xx supplies a development-budget proxy, not observed nickel-material purchasing; only an assumed eligible-material fraction is used. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.

31. Rolls-Royce Holdings Plc - 2025 Full Year Results

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2028 shop-visit target is below the reported 2025 total despite prospective fleet growth, qualifying any automatic conversion of fleet expansion into proportionate maintenance-material purchasing.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The divergence between 2025 engine deliveries and shop visits independently challenges a uniform new-engine-led material forecast; no service revenue is included in the numerator.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Observed engine-delivery and shop-visit activity supports separate new-program and replacement-demand assumptions, not a proportional material-purchase conversion.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

32. UKRI - Accelerating Manufacturing Readiness level of ABD-1000AM for AM of high temperature aerospace components (AMRAM1000)
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The Alloyed-led project has xx.xx of funding and an April 2025-October 2026 funded period. This independently establishes bounded development activity, not annual material sales or recurring production purchases. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
33. Safran - FY 2025 Results and Investor Update, February 13, 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))

34. Airbus - Full-Year 2025 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 deliveries by aircraft family provide the starting activity comparison for the initial-production forecast; aircraft delivery value is not included in the material numerator. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx% decline in 2025 self-financed R&D is counterevidence to uniform development-budget acceleration and supports a restrained, explicitly assumed development-purchasing scenario. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.

35. Airbus - Half-Year 2026 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 update retained the A320-family, A350 and other production-rate targets, providing a dated commercial constraint on the initial-production activity scenario rather than proof of future material orders. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: First-half 2026 self-financed R&D of EUR xx.xx versus EUR xx.xx provides a modest-growth countercheck for the assumed development-project activity path; the budget is not material-market revenue. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))

36. RTX Corporation - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

37. Federal Reserve Bank of St. Louis - Annual USD/GBP Exchange Rate, AEXUSUK
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
38. L3Harris Technologies, Inc. - Fiscal 2025 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
39. FAA Aerospace Forecast Fiscal Years 2025-2045 - Commercial Space
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated official low/high scenarios provide FY2032 licensed launch/reentry activity bounds. Their U.S.-licensed scope and treatment of reusable vehicles prevent direct conversion into Global material revenue. ([faa.gov](https://www.faa.gov/data_research/aviation/aerospace_forecasts/2025-commercial-space.pdf))
40. ICAO - Convention on International Civil Aviation, Ninth Edition
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))

41. DFARS 252.225-7009 - Restriction on Acquisition of Certain Articles Containing Specialty Metals
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
42. Aubert & Duval - Space Industry Metallurgical Solutions
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
43. Aubert & Duval - Metallurgical Solutions for the Defense Industry, June 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
44. Berkshire Hathaway Inc. - 2025 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.

45. Lufthansa Group Annual Report 2025 - MRO business segment
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
46. Oliver Wyman - Global Fleet And MRO Market Forecast 2026-2036: Key Trends
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
47. German Aerospace Center (DLR) - Financing
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
48. Federal Aviation Administration - Parts Manufacturer Approval (PMA): Design Approval
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.

49. Rolled Alloys - E-Services Stocking Programs
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
50. Boeing BDS Terms and Conditions Guide - D604 Raw Material Risk Mitigation
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
51. Carpenter Technology Corporation - Second Quarter Fiscal 2026 Earnings Call Presentation, January 29, 2026
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation distinguishes specialized non-LTA business from a conventional spot market, countering automatic classification of transactional sales as stock.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Three additional aerospace LTAs and xx.xx% sequential commercial-aerospace bookings growth inform the reservation hypothesis, but do not measure its modeled magnitude.
52. Precision Castparts Corp. - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.

53. Howmet Aerospace - United States Locations
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
54. ATI Inc. - 2024 Annual Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New sales commitments through 2040, including amounts expected during the remainder of the decade and predominantly involving jet-engine nickel alloys, inform the direct-program forecast premise without being counted as realized sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% of fiscal-2024 plate volume went to independent service centers, providing a historical comparison that cautions against assuming generalized intermediary displacement.
55. Alloyed - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.

56. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 aerospace realization and revenue provide the common monetary calibration for this modeled grade; neither is a grade-specific sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace material realization supplies a price-scale input, with modeled year and product-mix adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization calibrates the assumed blended material price, not this grade's observed revenue. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace realization provides a shared monetary comparison for the assumed grade price. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported eight-to-ten-year aerospace application-introduction periods constrain interpretation of the seven-year adoption forecast. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace application-introduction periods provide an adoption-delay counterweight, not a forecast sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
57. European Commission CORDIS - Welding Metallurgy and Cracking in Superalloys: Reporting
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical all-sector tonnage discussion is only a dominance cross-check; it cannot establish current aerospace monetary share. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies 718Plus separately from ordinary xx.xx supporting identity separation without supplying a current sales weight. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
58. Special Metals - Alloy Surcharge Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: August-October 2026 grade surcharges provide a differentiated cost-exposure check, not full invoice prices or observed 2032 prices. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx surcharge sequence independently qualifies a uniform price assumption; it is not substituted for a material selling price. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The grade-specific surcharge listing is a commercial cost comparison, not an observed Global grade realization. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))

59. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current-and-past supplier identity mapping only; not proof of 2025 aerospace sales or the modeled volume. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: CMSX-xx.xx is separately identified; the material-value weight remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current sales are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713C is listed separately from IN-713LC; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713LC is listed separately from IN-713C; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx identity mapping only; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-738LC is separately identified; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current aerospace tonnes are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx appears in a current-and-past identification list; this does not establish recurring aerospace production sales. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: MAR-M xx.xx is identified separately from CM247LC; monetary weights remain modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PWA xx.xx is separately identified; no attributable sales value is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; current commercial scale remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; no current grade-specific material sales are disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Udimet xx.xx appears in the supplier's current-and-past identities; aerospace attribution is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

60. GE Aerospace - Safety First: A Retiring GE Aerospace Materials Engineer Made Protecting Lives His Mission
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
61. Aubert & Duval - AD730: Ni-Based Superalloy for High Temperature Applications
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
62. University of Portsmouth - Improved Creep-Fatigue-Oxidation Resistance in Gas Turbine Disc Materials: REF Impact Case Study
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))

63. Influence of Long Term Exposure in Air on Microstructure, Surface Stability and Mechanical Properties of UDIMET 720LI

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The aerospace-industry publication distinguishes conventional Udimet xx.xx from its 720Li derivative; it does not establish a current monetary allocation. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The publication independently supports the 720Li identity and aircraft-engine-disc category, without supplying current sales. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

64. NASA Contractor Report 174639 - Literature Survey on Oxidations and Fatigue Lives at Elevated Temperatures

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical institutional material identification is a legacy-category anchor only; it does not demonstrate current aerospace material sales. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

65. America Makes - 5566.002 Proliferation of Nickel Superalloy Material Datasets for Powder Bed Fusion Additive Manufacturing

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))

66. GE Aerospace - Fourth Quarter 2025 Earnings Presentation

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 commercial-engine delivery growth supplies a near-term demand cross-check, not a grade-specific purchasing or seven-year growth observation. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aggregate commercial and defense delivery growth constrains the commercial-demand scenario without establishing this grade's attributable consumption. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported defense-engine delivery growth is a demand-exposure check only; the PWA xx.xx activity factor remains assumed. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

17.5. ASEAN

Table 377. ASEAN Nickel-Based Superalloys for Aerospace Market, by Country growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Brunei	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Cambodia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Indonesia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Lao People's Democratic Republic	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Malaysia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Myanmar	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Philippines	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Singapore	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Thailand	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Vietnam	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 378. ASEAN Nickel-Based Superalloys for Aerospace Market Size, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Brunei	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Cambodia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Indonesia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Lao People's Democratic Republic	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Malaysia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Myanmar	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Philippines	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Singapore	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Thailand	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Vietnam	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 379. ASEAN Nickel-Based Superalloys for Aerospace Market Size, by Product Form, 2017-2040 (USD Million)

Product Form	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Bars, Rods and Profiles	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Billets and Forging Stock	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ingots	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Plate, Sheet, Strip and Foil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Powder	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Tubes and Pipes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Wire	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 380. ASEAN Nickel-Based Superalloys for Aerospace Market Size, by Strengthening Class, 2017-2040 (USD Million)

Strengthening Class	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Dispersion-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Precipitation-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Solid-Solution-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 381. ASEAN Nickel-Based Superalloys for Aerospace Market Size, by Component Application, 2017-2040 (USD Million)

Component Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Breathing Propulsion & Auxiliary Power	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Systems & Equipment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rocket & Spacecraft Propulsion	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Vehicle Structures & Thermal Protection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 382. ASEAN Nickel-Based Superalloys for Aerospace Market Size, by Air-Breathing Propulsion & Auxiliary Power, 2017-2040 (USD Million)

Air-Breathing Propulsion & Auxiliary Power	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combustion & Exhaust Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Compressor Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine Structures & Auxiliary Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Blades & Vanes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Disks & Rotor Hardware	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 383. ASEAN Nickel-Based Superalloys for Aerospace Market Size, by Demand Stage, 2017-2040 (USD Million)

Demand Stage	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Initial Equipment Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Repair, Overhaul & Refurbishment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Replacement & Retrofit Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research, Development & Qualification	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 384. ASEAN Nickel-Based Superalloys for Aerospace Market Size, by Aerospace End Market, 2017-2040 (USD Million)

Aerospace End Market	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Civil & Nonmilitary State Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Guided Missile Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Military Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Space Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 385. ASEAN Nickel-Based Superalloys for Aerospace Market Size, by Buyer Function, 2017-2040 (USD Million)

Buyer Function	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Aerospace Vehicle Manufacturers & Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Component & Subassembly Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine & Propulsion-System Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Maintenance, Repair & Overhaul Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Development Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 386. ASEAN Nickel-Based Superalloys for Aerospace Market Size, by Fulfillment Model, 2017-2040 (USD Million)

Fulfillment Model	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Order-Dedicated Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stock Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 387. ASEAN Nickel-Based Superalloys for Aerospace Market Size, by Supply Channel, 2017-2040 (USD Million)

Supply Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Captive Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent Intermediary Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Producer-Direct Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 388. ASEAN Nickel-Based Superalloys for Aerospace Market Size, by Alloy Grade, 2017-2040 (USD Million)

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ABD-1000AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
ABD-900AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 388 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
AD730	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy 718Plus	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy X-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CM247LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CMSX-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hastelloy X	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713C	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-738LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
MAR-M xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic 80A	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene 88DT	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 388 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
RR1000	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet 720Li	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Waspaloy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. ATI Inc. - 2025 Form 10-K

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC's reported financial/product-category inputs and listed ingot offering constrain the eligible material envelope; the ingot allocation remains assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: AA&S sales of USD xx.xx and its xx.xx% nickel-based/specialty-alloy category anchor the separately adjusted rolled-material envelope.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial jet-engine revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025, supporting purchasing recovery but not identifying price growth or a 2032 material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))

2. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
3. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Narrow-strip supply supports a limited flat-product allocation within the modeled eligible Carpenter envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire is a disclosed supplied form; its eligible monetary weight remains modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.

4. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical xx.xx% slab/bar/billet revenue category constrains the long-stock proxy; its eligible billet split is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported combined stock category provides a proxy anchor, not a separately disclosed bar revenue share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 flat products represented approximately xx.xx% of net product revenue; extrapolation to the eligible Acerinox envelope is modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 wire represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 tubulars represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical product revenue, channel mix and backlog conversion anchor the modeled stock value weight, with explicit scope adjustments.

5. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Casting-alloy activities support an ingot-material equivalent rather than attributing full engine-component revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed metal/billet activities support retaining a forging-stock allocation; the assumed xx.xx% weight is not reported.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported 2025 sales of USD xx.xx and Engine Products aerospace revenues of USD xx.xx commercial and USD xx.xx defense establish the component-cohort scale; USD xx.xx gas-turbine revenue is excluded through an explicit attribution model. These are not material-market revenues. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The segment/end-market revenue table supplies the aerospace and gas-turbine boundaries needed to bridge combined spares activity into an aerospace replacement-material proxy. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial aerospace represented xx.xx% of 2025 company sales, supplying an independent downstream mix comparison rather than a nickel-material allocation weight. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense aerospace represented xx.xx% of 2025 company sales; the paired commercial/defense comparison tests the aviation model while retaining component and material-scope differences. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.

6. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: GE describes repaired/serviceable-part reuse, supporting a counterforce to converting aftermarket activity directly into newly supplied material purchases. Its reported approximately xx.xx% strategic-nickel revert content is not deducted from the terminal-material market. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Commercial repair and component reuse support retaining uncertainty around replacement-related combustion material purchases. The selected procurement-intensity offset remains an assumption, not a measured avoided-purchase percentage. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
7. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2023
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Older bar-import input.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Older bar-import input with explicit aerospace exclusion and temporal bridge.
8. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2023
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2023 flat-product input.
9. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2023
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Engine-parts trade supplies a low-intensity activity primitive; the xx.xx% material-equivalent bridge is assumed, not observed alloy sales.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Engine-parts trade supplies a low-intensity activity primitive; the material-equivalent bridge is assumed.
10. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Component-trade exposure qualifies a direct conversion of maintenance-hub activity into raw-material demand.

11. Special Metals - Tech Center
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised ingot supply establishes a PCC material-form crosswalk, not its sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised billet supply supports the forging-stock category mapping within the inherited PCC envelope.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised bar supply supports classification only; the monetary coefficient is an assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Plate, sheet and strip offerings support a distinct flat-product allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire availability supports the material-form crosswalk without establishing revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Tubing availability supports the material-form crosswalk without establishing revenue.
12. DPC Holdings Limited - Registration Statement with 2025 Financial Statements
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing separates ingots from component sales and describes external supply and xx.xx% internal superalloy sourcing, contradicting the inherited xx.xx% captive parameter.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
13. Acerinox - Results FY 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned US long-product expansion supports the relative conventional-long-material premise; investment is not recognized as sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately USD xx.xx of planned platform investment includes expansion of the long-products offering, informing the bars forecast premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace demand and planned long-product diversification support testing a relative mix shift without assuming flat-product contraction.

14. Haynes International - HAYNES 282
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Powder is offered alongside conventional forms for HAYNES xx.xx supporting nonexclusive form classification, not an observed sales allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
15. CMA - Anticipated Acquisition of Haynes International by Acerinox: Full Text Decision
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct customer evidence in paragraphs xx.xx-xx.xx supports separate flat/long purchasing pools; no published market-share table is used.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Shape-specific purchasing supports a distinct long-stock allocation model without proving a separate competitive market for billet.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.

16. Haynes International - HAYNES 230
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
17. Carpenter Technology - Advanced Materials for Aerospace Motor & Engines
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))
18. Elementum 3D - Metal Alloy Additive Manufacturing Colorado
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed. ([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed. ([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))
19. NASA - NASA-Developed Printable Metal Can Take the Heat
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake. ([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake. ([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

20. Carpenter Technology - Lighter, Faster, Stronger Metallurgy for Defense, July 2025

    · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
    ([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

    · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
    ([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

21. Special Metals - Aerospace

    · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight.
    ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

    · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight.
    ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

    · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy xx.xx; no sales weight is disclosed.
    ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

    · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy X-xx.xx; no current sales quantity is disclosed.
    ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

    · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Waspaloy; no sales weight is disclosed.
    ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

22. Boeing - BDS Terms and Conditions Guide, D607 Material Substitution Prohibition, November 15, 2013
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: D607 prohibits unauthorized material substitutions while recognizing specified alternatives. It constrains assumptions about frictionless cross-class substitution, without quantifying adoption delays. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization requirements qualify assumptions about precipitation-family substitution opportunities; the clause does not prove future purchases or a class-growth premium. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause prohibits unauthorized substitutions where contractually applicable. It constrains the adoption interpretation but does not establish approval prevalence or a numerical adoption rate. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific material authorization is a counterweight to treating a named offering as immediately substitutable production material. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization limits interpretation of the assumed adoption multiplier; it does not directly establish powder sales. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))

23. Precision Castparts Corp. - Fiscal 2015 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
24. NASA - Chapter 2: Aerospace Materials Characteristics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

25. ESA - ESA Space Environment Report 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
26. NASA and Superalloys: A Customer, a Participant, and a Referee
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
27. VDM Metals - Alloys for the Aerospace Industry
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
28. Carpenter Technology - Business Segments
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))

29. Howmet Aerospace - 2025 Annual Report, Letter to Shareholders

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% combined aerospace and gas-turbine spares revenue constrains the distinction between initial-production and spare-component activity; material and destination adjustments remain modeled. ([howmet.com](https://www.howmet.com/annualreport/))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed combined spares proportion supplies the replacement proxy; approximately xx.xx% commercial aerospace engine-spares growth is historical counterevidence against assuming weak aftermarket activity. ([howmet.com](https://www.howmet.com/annualreport/))

30. GE Aerospace - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment and services costs provide commercial budget anchors for the common material-value denominator; assumed eligible-material fractions prevent full equipment or service value from entering the allocation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Services include spare parts and maintenance activity, supporting an explicit new-article versus restoration attribution rather than equating services revenue with replacement-material purchases. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported USD xx.xx services cost anchors the restoration-material bridge; the restoration allocation and direct eligible-material fraction are assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Total funded R&D of USD xx.xx supplies a development-budget proxy, not observed nickel-material purchasing; only an assumed eligible-material fraction is used. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.

31. Rolls-Royce Holdings Plc - 2025 Full Year Results

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2028 shop-visit target is below the reported 2025 total despite prospective fleet growth, qualifying any automatic conversion of fleet expansion into proportionate maintenance-material purchasing.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The divergence between 2025 engine deliveries and shop visits independently challenges a uniform new-engine-led material forecast; no service revenue is included in the numerator.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Observed engine-delivery and shop-visit activity supports separate new-program and replacement-demand assumptions, not a proportional material-purchase conversion.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

32. UKRI - Accelerating Manufacturing Readiness level of ABD-1000AM for AM of high temperature aerospace components (AMRAM1000)
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The Alloyed-led project has xx.xx of funding and an April 2025-October 2026 funded period. This independently establishes bounded development activity, not annual material sales or recurring production purchases. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
33. Safran - FY 2025 Results and Investor Update, February 13, 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))

34. Airbus - Full-Year 2025 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 deliveries by aircraft family provide the starting activity comparison for the initial-production forecast; aircraft delivery value is not included in the material numerator. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx% decline in 2025 self-financed R&D is counterevidence to uniform development-budget acceleration and supports a restrained, explicitly assumed development-purchasing scenario. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.

35. Airbus - Half-Year 2026 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 update retained the A320-family, A350 and other production-rate targets, providing a dated commercial constraint on the initial-production activity scenario rather than proof of future material orders. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: First-half 2026 self-financed R&D of EUR xx.xx versus EUR xx.xx provides a modest-growth countercheck for the assumed development-project activity path; the budget is not material-market revenue. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))

36. RTX Corporation - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

37. Federal Reserve Bank of St. Louis - Annual USD/GBP Exchange Rate, AEXUSUK
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
38. L3Harris Technologies, Inc. - Fiscal 2025 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
39. FAA Aerospace Forecast Fiscal Years 2025-2045 - Commercial Space
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated official low/high scenarios provide FY2032 licensed launch/reentry activity bounds. Their U.S.-licensed scope and treatment of reusable vehicles prevent direct conversion into Global material revenue. ([faa.gov](https://www.faa.gov/data_research/aviation/aerospace_forecasts/2025-commercial-space.pdf))
40. ICAO - Convention on International Civil Aviation, Ninth Edition
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))

41. DFARS 252.225-7009 - Restriction on Acquisition of Certain Articles Containing Specialty Metals
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
42. Aubert & Duval - Space Industry Metallurgical Solutions
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
43. Aubert & Duval - Metallurgical Solutions for the Defense Industry, June 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
44. Berkshire Hathaway Inc. - 2025 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.

45. Lufthansa Group Annual Report 2025 - MRO business segment
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
46. Oliver Wyman - Global Fleet And MRO Market Forecast 2026-2036: Key Trends
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
47. German Aerospace Center (DLR) - Financing
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
48. Federal Aviation Administration - Parts Manufacturer Approval (PMA): Design Approval
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.

49. Rolled Alloys - E-Services Stocking Programs
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
50. Boeing BDS Terms and Conditions Guide - D604 Raw Material Risk Mitigation
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
51. Carpenter Technology Corporation - Second Quarter Fiscal 2026 Earnings Call Presentation, January 29, 2026
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation distinguishes specialized non-LTA business from a conventional spot market, countering automatic classification of transactional sales as stock.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Three additional aerospace LTAs and xx.xx% sequential commercial-aerospace bookings growth inform the reservation hypothesis, but do not measure its modeled magnitude.
52. Precision Castparts Corp. - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.

53. Howmet Aerospace - United States Locations
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
54. ATI Inc. - 2024 Annual Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New sales commitments through 2040, including amounts expected during the remainder of the decade and predominantly involving jet-engine nickel alloys, inform the direct-program forecast premise without being counted as realized sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% of fiscal-2024 plate volume went to independent service centers, providing a historical comparison that cautions against assuming generalized intermediary displacement.
55. Alloyed - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.

56. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 aerospace realization and revenue provide the common monetary calibration for this modeled grade; neither is a grade-specific sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace material realization supplies a price-scale input, with modeled year and product-mix adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization calibrates the assumed blended material price, not this grade's observed revenue. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace realization provides a shared monetary comparison for the assumed grade price. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported eight-to-ten-year aerospace application-introduction periods constrain interpretation of the seven-year adoption forecast. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace application-introduction periods provide an adoption-delay counterweight, not a forecast sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
57. European Commission CORDIS - Welding Metallurgy and Cracking in Superalloys: Reporting
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical all-sector tonnage discussion is only a dominance cross-check; it cannot establish current aerospace monetary share. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies 718Plus separately from ordinary xx.xx supporting identity separation without supplying a current sales weight. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
58. Special Metals - Alloy Surcharge Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: August-October 2026 grade surcharges provide a differentiated cost-exposure check, not full invoice prices or observed 2032 prices. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx surcharge sequence independently qualifies a uniform price assumption; it is not substituted for a material selling price. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The grade-specific surcharge listing is a commercial cost comparison, not an observed Global grade realization. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))

59. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current-and-past supplier identity mapping only; not proof of 2025 aerospace sales or the modeled volume. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: CMSX-xx.xx is separately identified; the material-value weight remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current sales are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713C is listed separately from IN-713LC; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713LC is listed separately from IN-713C; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx identity mapping only; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-738LC is separately identified; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current aerospace tonnes are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx appears in a current-and-past identification list; this does not establish recurring aerospace production sales. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: MAR-M xx.xx is identified separately from CM247LC; monetary weights remain modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PWA xx.xx is separately identified; no attributable sales value is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; current commercial scale remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; no current grade-specific material sales are disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Udimet xx.xx appears in the supplier's current-and-past identities; aerospace attribution is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

60. GE Aerospace - Safety First: A Retiring GE Aerospace Materials Engineer Made Protecting Lives His Mission
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
61. Aubert & Duval - AD730: Ni-Based Superalloy for High Temperature Applications
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
62. University of Portsmouth - Improved Creep-Fatigue-Oxidation Resistance in Gas Turbine Disc Materials: REF Impact Case Study
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))

63. Influence of Long Term Exposure in Air on Microstructure, Surface Stability and Mechanical Properties of UDIMET 720LI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The aerospace-industry publication distinguishes conventional Udimet xx.xx from its 720Li derivative; it does not establish a current monetary allocation. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The publication independently supports the 720Li identity and aircraft-engine-disc category, without supplying current sales. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

64. NASA Contractor Report 174639 - Literature Survey on Oxidations and Fatigue Lives at Elevated Temperatures

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical institutional material identification is a legacy-category anchor only; it does not demonstrate current aerospace material sales. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

65. America Makes - 5566.002 Proliferation of Nickel Superalloy Material Datasets for Powder Bed Fusion Additive Manufacturing

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))

66. GE Aerospace - Fourth Quarter 2025 Earnings Presentation

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 commercial-engine delivery growth supplies a near-term demand cross-check, not a grade-specific purchasing or seven-year growth observation. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aggregate commercial and defense delivery growth constrains the commercial-demand scenario without establishing this grade's attributable consumption. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported defense-engine delivery growth is a demand-exposure check only; the PWA xx.xx activity factor remains assumed. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

17.6. GCC

Table 389. GCC Nickel-Based Superalloys for Aerospace Market, by Country growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Bahrain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Kuwait	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Oman	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Qatar	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Saudi Arabia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Arab Emirates	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 390. GCC Nickel-Based Superalloys for Aerospace Market Size, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Bahrain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Kuwait	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Oman	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Qatar	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Saudi Arabia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Arab Emirates	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 391. GCC Nickel-Based Superalloys for Aerospace Market Size, by Product Form, 2017-2040 (USD Million)

Product Form	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Bars, Rods and Profiles	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Billets and Forging Stock	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ingots	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Plate, Sheet, Strip and Foil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Powder	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Tubes and Pipes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Wire	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 392. GCC Nickel-Based Superalloys for Aerospace Market Size, by Strengthening Class, 2017-2040 (USD Million)

Strengthening Class	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Dispersion-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Precipitation-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Solid-Solution-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 393. GCC Nickel-Based Superalloys for Aerospace Market Size, by Component Application, 2017-2040 (USD Million)

Component Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Breathing Propulsion & Auxiliary Power	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Systems & Equipment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rocket & Spacecraft Propulsion	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Vehicle Structures & Thermal Protection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 394. GCC Nickel-Based Superalloys for Aerospace Market Size, by Air-Breathing Propulsion & Auxiliary Power, 2017-2040 (USD Million)

Air-Breathing Propulsion & Auxiliary Power	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combustion & Exhaust Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Compressor Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine Structures & Auxiliary Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Blades & Vanes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Disks & Rotor Hardware	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 395. GCC Nickel-Based Superalloys for Aerospace Market Size, by Demand Stage, 2017-2040 (USD Million)

Demand Stage	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Initial Equipment Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Repair, Overhaul & Refurbishment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Replacement & Retrofit Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research, Development & Qualification	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 396. GCC Nickel-Based Superalloys for Aerospace Market Size, by Aerospace End Market, 2017-2040 (USD Million)

Aerospace End Market	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Civil & Nonmilitary State Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Guided Missile Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Military Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Space Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 397. GCC Nickel-Based Superalloys for Aerospace Market Size, by Buyer Function, 2017-2040 (USD Million)

Buyer Function	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Aerospace Vehicle Manufacturers & Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Component & Subassembly Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine & Propulsion-System Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Maintenance, Repair & Overhaul Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Development Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 398. GCC Nickel-Based Superalloys for Aerospace Market Size, by Fulfillment Model, 2017-2040 (USD Million)

Fulfillment Model	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Order-Dedicated Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stock Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 399. GCC Nickel-Based Superalloys for Aerospace Market Size, by Supply Channel, 2017-2040 (USD Million)

Supply Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Captive Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent Intermediary Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Producer-Direct Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 400. GCC Nickel-Based Superalloys for Aerospace Market Size, by Alloy Grade, 2017-2040 (USD Million)

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ABD-1000AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
ABD-900AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
AD730	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy 718Plus	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy X-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CM247LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CMSX-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hastelloy X	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713C	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 400 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
IN-713LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-738LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
MAR-M xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic 80A	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene 88DT	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
RR1000	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet 720Li	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Waspaloy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. ATI Inc. - 2025 Form 10-K

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC's reported financial/product-category inputs and listed ingot offering constrain the eligible material envelope; the ingot allocation remains assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: AA&S sales of USD xx.xx and its xx.xx% nickel-based/specialty-alloy category anchor the separately adjusted rolled-material envelope.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial jet-engine revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025, supporting purchasing recovery but not identifying price growth or a 2032 material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))

2. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
3. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Narrow-strip supply supports a limited flat-product allocation within the modeled eligible Carpenter envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire is a disclosed supplied form; its eligible monetary weight remains modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.

4. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical xx.xx% slab/bar/billet revenue category constrains the long-stock proxy; its eligible billet split is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported combined stock category provides a proxy anchor, not a separately disclosed bar revenue share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 flat products represented approximately xx.xx% of net product revenue; extrapolation to the eligible Acerinox envelope is modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 wire represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 tubulars represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical product revenue, channel mix and backlog conversion anchor the modeled stock value weight, with explicit scope adjustments.

5. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Casting-alloy activities support an ingot-material equivalent rather than attributing full engine-component revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed metal/billet activities support retaining a forging-stock allocation; the assumed xx.xx% weight is not reported.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported 2025 sales of USD xx.xx and Engine Products aerospace revenues of USD xx.xx commercial and USD xx.xx defense establish the component-cohort scale; USD xx.xx gas-turbine revenue is excluded through an explicit attribution model. These are not material-market revenues. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The segment/end-market revenue table supplies the aerospace and gas-turbine boundaries needed to bridge combined spares activity into an aerospace replacement-material proxy. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial aerospace represented xx.xx% of 2025 company sales, supplying an independent downstream mix comparison rather than a nickel-material allocation weight. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense aerospace represented xx.xx% of 2025 company sales; the paired commercial/defense comparison tests the aviation model while retaining component and material-scope differences. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.

6. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: GE describes repaired/serviceable-part reuse, supporting a counterforce to converting aftermarket activity directly into newly supplied material purchases. Its reported approximately xx.xx% strategic-nickel revert content is not deducted from the terminal-material market. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Commercial repair and component reuse support retaining uncertainty around replacement-related combustion material purchases. The selected procurement-intensity offset remains an assumption, not a measured avoided-purchase percentage. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
7. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2023
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Older bar-import input with explicit temporal and relevance bridge.
8. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2023
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2023 flat-product input supplements the older bar primitive.
9. Sanad - Expanded GE Aerospace and Safran LEAP agreement, July 2, 2025
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Completed shop visits establish existing service activity; announced expansion constrains timing but does not establish alloy procurement or forecast revenue.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Completed shop visits establish existing service activity; announced expansion constrains timing but does not establish alloy procurement or forecast revenue.

10. Special Metals - Tech Center
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised ingot supply establishes a PCC material-form crosswalk, not its sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised billet supply supports the forging-stock category mapping within the inherited PCC envelope.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised bar supply supports classification only; the monetary coefficient is an assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Plate, sheet and strip offerings support a distinct flat-product allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire availability supports the material-form crosswalk without establishing revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Tubing availability supports the material-form crosswalk without establishing revenue.
11. DPC Holdings Limited - Registration Statement with 2025 Financial Statements
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing separates ingots from component sales and describes external supply and xx.xx% internal superalloy sourcing, contradicting the inherited xx.xx% captive parameter.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
12. Acerinox - Results FY 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned US long-product expansion supports the relative conventional-long-material premise; investment is not recognized as sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately USD xx.xx of planned platform investment includes expansion of the long-products offering, informing the bars forecast premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace demand and planned long-product diversification support testing a relative mix shift without assuming flat-product contraction.

13. Haynes International - HAYNES 282
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Powder is offered alongside conventional forms for HAYNES xx.xx supporting nonexclusive form classification, not an observed sales allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
14. CMA - Anticipated Acquisition of Haynes International by Acerinox: Full Text Decision
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct customer evidence in paragraphs xx.xx-xx.xx supports separate flat/long purchasing pools; no published market-share table is used.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Shape-specific purchasing supports a distinct long-stock allocation model without proving a separate competitive market for billet.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.

15. Haynes International - HAYNES 230
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
16. Carpenter Technology - Advanced Materials for Aerospace Motor & Engines
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))
17. Elementum 3D - Metal Alloy Additive Manufacturing Colorado
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed. ([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed. ([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))
18. NASA - NASA-Developed Printable Metal Can Take the Heat
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake. ([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake. ([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

19. Carpenter Technology - Lighter, Faster, Stronger Metallurgy for Defense, July 2025

    · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
    ([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

    · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
    ([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

20. Special Metals - Aerospace

    · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight.
    ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

    · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight.
    ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

    · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy xx.xx; no sales weight is disclosed.
    ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

    · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy X-xx.xx; no current sales quantity is disclosed.
    ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

    · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Waspaloy; no sales weight is disclosed.
    ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

21. Boeing - BDS Terms and Conditions Guide, D607 Material Substitution Prohibition, November 15, 2013

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: D607 prohibits unauthorized material substitutions while recognizing specified alternatives. It constrains assumptions about frictionless cross-class substitution, without quantifying adoption delays. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization requirements qualify assumptions about precipitation-family substitution opportunities; the clause does not prove future purchases or a class-growth premium. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause prohibits unauthorized substitutions where contractually applicable. It constrains the adoption interpretation but does not establish approval prevalence or a numerical adoption rate. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific material authorization is a counterweight to treating a named offering as immediately substitutable production material. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization limits interpretation of the assumed adoption multiplier; it does not directly establish powder sales. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))

22. Precision Castparts Corp. - Fiscal 2015 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.

23. NASA - Chapter 2: Aerospace Materials Characteristics

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

24. ESA - ESA Space Environment Report 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
25. NASA and Superalloys: A Customer, a Participant, and a Referee
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
26. VDM Metals - Alloys for the Aerospace Industry
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
27. Carpenter Technology - Business Segments
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))

28. Howmet Aerospace - 2025 Annual Report, Letter to Shareholders

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% combined aerospace and gas-turbine spares revenue constrains the distinction between initial-production and spare-component activity; material and destination adjustments remain modeled. ([howmet.com](https://www.howmet.com/annualreport/))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed combined spares proportion supplies the replacement proxy; approximately xx.xx% commercial aerospace engine-spares growth is historical counterevidence against assuming weak aftermarket activity. ([howmet.com](https://www.howmet.com/annualreport/))

29. GE Aerospace - 2025 Form 10-K

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment and services costs provide commercial budget anchors for the common material-value denominator; assumed eligible-material fractions prevent full equipment or service value from entering the allocation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Services include spare parts and maintenance activity, supporting an explicit new-article versus restoration attribution rather than equating services revenue with replacement-material purchases. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported USD xx.xx services cost anchors the restoration-material bridge; the restoration allocation and direct eligible-material fraction are assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Total funded R&D of USD xx.xx supplies a development-budget proxy, not observed nickel-material purchasing; only an assumed eligible-material fraction is used. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.

30. Rolls-Royce Holdings Plc - 2025 Full Year Results

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2028 shop-visit target is below the reported 2025 total despite prospective fleet growth, qualifying any automatic conversion of fleet expansion into proportionate maintenance-material purchasing.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The divergence between 2025 engine deliveries and shop visits independently challenges a uniform new-engine-led material forecast; no service revenue is included in the numerator.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Observed engine-delivery and shop-visit activity supports separate new-program and replacement-demand assumptions, not a proportional material-purchase conversion.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

31. UKRI - Accelerating Manufacturing Readiness level of ABD-1000AM for AM of high temperature aerospace components (AMRAM1000)
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The Alloyed-led project has xx.xx of funding and an April 2025-October 2026 funded period. This independently establishes bounded development activity, not annual material sales or recurring production purchases. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
32. Safran - FY 2025 Results and Investor Update, February 13, 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))

33. Airbus - Full-Year 2025 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 deliveries by aircraft family provide the starting activity comparison for the initial-production forecast; aircraft delivery value is not included in the material numerator. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx% decline in 2025 self-financed R&D is counterevidence to uniform development-budget acceleration and supports a restrained, explicitly assumed development-purchasing scenario. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.

34. Airbus - Half-Year 2026 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 update retained the A320-family, A350 and other production-rate targets, providing a dated commercial constraint on the initial-production activity scenario rather than proof of future material orders. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: First-half 2026 self-financed R&D of EUR xx.xx versus EUR xx.xx provides a modest-growth countercheck for the assumed development-project activity path; the budget is not material-market revenue. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))

35. RTX Corporation - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

36. Federal Reserve Bank of St. Louis - Annual USD/GBP Exchange Rate, AEXUSUK
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
37. L3Harris Technologies, Inc. - Fiscal 2025 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
38. FAA Aerospace Forecast Fiscal Years 2025-2045 - Commercial Space
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated official low/high scenarios provide FY2032 licensed launch/reentry activity bounds. Their U.S.-licensed scope and treatment of reusable vehicles prevent direct conversion into Global material revenue. ([faa.gov](https://www.faa.gov/data_research/aviation/aerospace_forecasts/2025-commercial-space.pdf))
39. ICAO - Convention on International Civil Aviation, Ninth Edition
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))

40. DFARS 252.225-7009 - Restriction on Acquisition of Certain Articles Containing Specialty Metals
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
41. Aubert & Duval - Space Industry Metallurgical Solutions
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
42. Aubert & Duval - Metallurgical Solutions for the Defense Industry, June 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
43. Berkshire Hathaway Inc. - 2025 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.

44. Lufthansa Group Annual Report 2025 - MRO business segment
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
45. Oliver Wyman - Global Fleet And MRO Market Forecast 2026-2036: Key Trends
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
46. German Aerospace Center (DLR) - Financing
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
47. Federal Aviation Administration - Parts Manufacturer Approval (PMA): Design Approval
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.

48. Rolled Alloys - E-Services Stocking Programs
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
49. Boeing BDS Terms and Conditions Guide - D604 Raw Material Risk Mitigation
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
50. Carpenter Technology Corporation - Second Quarter Fiscal 2026 Earnings Call Presentation, January 29, 2026
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation distinguishes specialized non-LTA business from a conventional spot market, countering automatic classification of transactional sales as stock.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Three additional aerospace LTAs and xx.xx% sequential commercial-aerospace bookings growth inform the reservation hypothesis, but do not measure its modeled magnitude.
51. Precision Castparts Corp. - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.

52. Howmet Aerospace - United States Locations
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
53. ATI Inc. - 2024 Annual Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New sales commitments through 2040, including amounts expected during the remainder of the decade and predominantly involving jet-engine nickel alloys, inform the direct-program forecast premise without being counted as realized sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% of fiscal-2024 plate volume went to independent service centers, providing a historical comparison that cautions against assuming generalized intermediary displacement.
54. Alloyed - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.

55. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 aerospace realization and revenue provide the common monetary calibration for this modeled grade; neither is a grade-specific sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace material realization supplies a price-scale input, with modeled year and product-mix adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization calibrates the assumed blended material price, not this grade's observed revenue. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace realization provides a shared monetary comparison for the assumed grade price. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported eight-to-ten-year aerospace application-introduction periods constrain interpretation of the seven-year adoption forecast. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace application-introduction periods provide an adoption-delay counterweight, not a forecast sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
56. European Commission CORDIS - Welding Metallurgy and Cracking in Superalloys: Reporting
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical all-sector tonnage discussion is only a dominance cross-check; it cannot establish current aerospace monetary share. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies 718Plus separately from ordinary xx.xx supporting identity separation without supplying a current sales weight. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
57. Special Metals - Alloy Surcharge Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: August-October 2026 grade surcharges provide a differentiated cost-exposure check, not full invoice prices or observed 2032 prices. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx surcharge sequence independently qualifies a uniform price assumption; it is not substituted for a material selling price. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The grade-specific surcharge listing is a commercial cost comparison, not an observed Global grade realization. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))

58. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current-and-past supplier identity mapping only; not proof of 2025 aerospace sales or the modeled volume. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: CMSX-xx.xx is separately identified; the material-value weight remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current sales are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713C is listed separately from IN-713LC; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713LC is listed separately from IN-713C; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx identity mapping only; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-738LC is separately identified; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current aerospace tonnes are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx appears in a current-and-past identification list; this does not establish recurring aerospace production sales. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: MAR-M xx.xx is identified separately from CM247LC; monetary weights remain modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PWA xx.xx is separately identified; no attributable sales value is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; current commercial scale remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; no current grade-specific material sales are disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Udimet xx.xx appears in the supplier's current-and-past identities; aerospace attribution is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

59. GE Aerospace - Safety First: A Retiring GE Aerospace Materials Engineer Made Protecting Lives His Mission
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
60. Aubert & Duval - AD730: Ni-Based Superalloy for High Temperature Applications
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
61. University of Portsmouth - Improved Creep-Fatigue-Oxidation Resistance in Gas Turbine Disc Materials: REF Impact Case Study
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))

62. Influence of Long Term Exposure in Air on Microstructure, Surface Stability and Mechanical Properties of UDIMET 720LI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The aerospace-industry publication distinguishes conventional Udimet xx.xx from its 720Li derivative; it does not establish a current monetary allocation. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The publication independently supports the 720Li identity and aircraft-engine-disc category, without supplying current sales. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

63. NASA Contractor Report 174639 - Literature Survey on Oxidations and Fatigue Lives at Elevated Temperatures

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical institutional material identification is a legacy-category anchor only; it does not demonstrate current aerospace material sales. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

64. America Makes - 5566.002 Proliferation of Nickel Superalloy Material Datasets for Powder Bed Fusion Additive Manufacturing

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))

65. GE Aerospace - Fourth Quarter 2025 Earnings Presentation

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 commercial-engine delivery growth supplies a near-term demand cross-check, not a grade-specific purchasing or seven-year growth observation. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aggregate commercial and defense delivery growth constrains the commercial-demand scenario without establishing this grade's attributable consumption. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported defense-engine delivery growth is a demand-exposure check only; the PWA xx.xx activity factor remains assumed. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

18. Nickel-Based Superalloys for Aerospace Market, by Country

For a United States requirement involving Canadian material, the contract can matter more than the shared North American location. ■■■■■ ■■■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■ ■■■■■ ■■■■■■■■■■ ■■■■■ ■ ■■■■■■■■ ■■■■■■■■ ■■ ■■■■■■■■■■ ■■■■ ■■■■■■■■ ■■ ■■■■■■■■■■ ■■ ■■■ ■■■■■■■ ■■■■■■■ ■■ ■■■ ■■■■■■■■■ ■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■■■■■■ ■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■ ■■■ ■■■■■■■■■■■ ■■■■■■■ ■■■■■■■■ ■■ ■■■ ■■■■■■■■■■■■■■■■■■■ ■■■■■■■■■■ ■ ■■■■■■■ ■■■■■■■ ■■■■■■■■ ■■■■■ ■■■■■■■■■■ ■■■■■■■■ ■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■■■■ Canadian sourcing can be a supported route in one relationship without being interchangeable with U.S.-origin material in another.

India illustrates a different approval authority. ■■■■■■■ ■■■■■■■ ■■■■■■■ ■■■■■■■■■■■■■■ ■■■■■■■■■ ■■■ ■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■ ■■■ ■■■■■ ■■■ ■■■■■■■■■■■ ■■■■■■■ ■■■■■■■■■■■ ■■■ ■■■ ■■■■■■■■■■■■■ ■■■■ ■■■ ■■■■■■■■ ■■■■■ ■■■■■■■ ■■■■■■■■■■■■■■ ■■ ■■■■■■■■■ ■■■■■ ■■■■■■■■■■■■ ■■■■ ■■■■■■■ ■■■■■■■ ■■■■■■■ ■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■ ■■■■■■■ ■■■■■■■■■■ ■■ ■■■ ■■■■■■■■■■ ■■■ ■■■■■■■■■ ■■■■■■■■■ ■■ ■■■■ ■■■■■■■■ ■■■■ ■ ■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■ ■■■ ■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■ ■■ ■■■■■ ■■■■■■■■ ■■■■■ ■■■■■■■ ■■■■■ ■■■■■■■■ ■■ ■■■■■■ ■■■■■■■■■■■■■ It can support evaluation of a domestic sourcing route without establishing unrestricted international substitutability.

Figure 30. Global Nickel-Based Superalloys for Aerospace Market Size, by Country, 2025 vs 2032 (%)

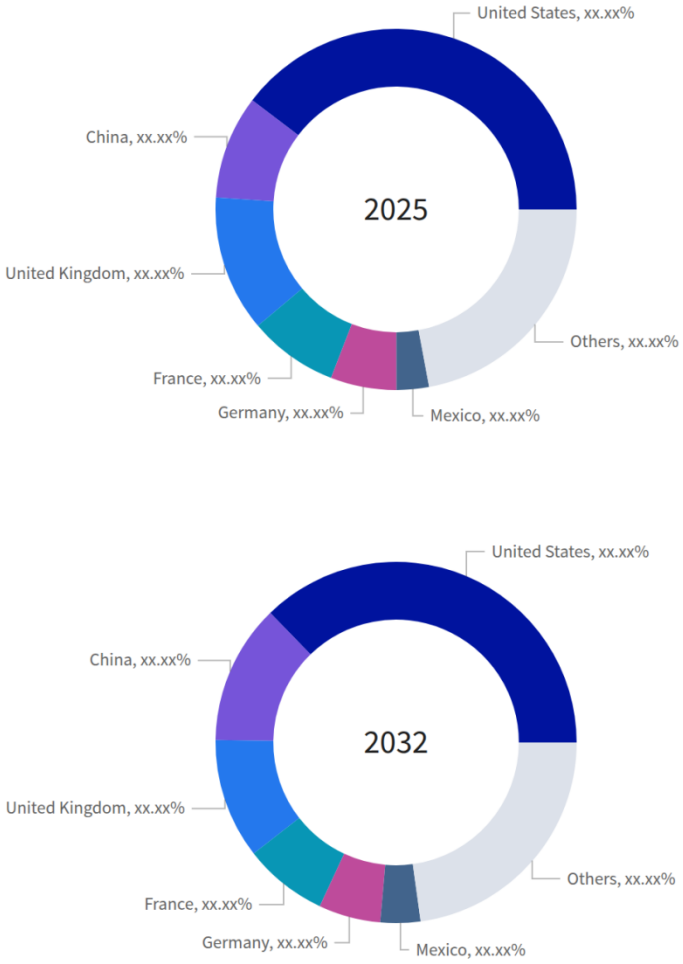

Figure 31. Global Nickel-Based Superalloys for Aerospace Market Size, by Country, 2025 vs 2026 vs 2032

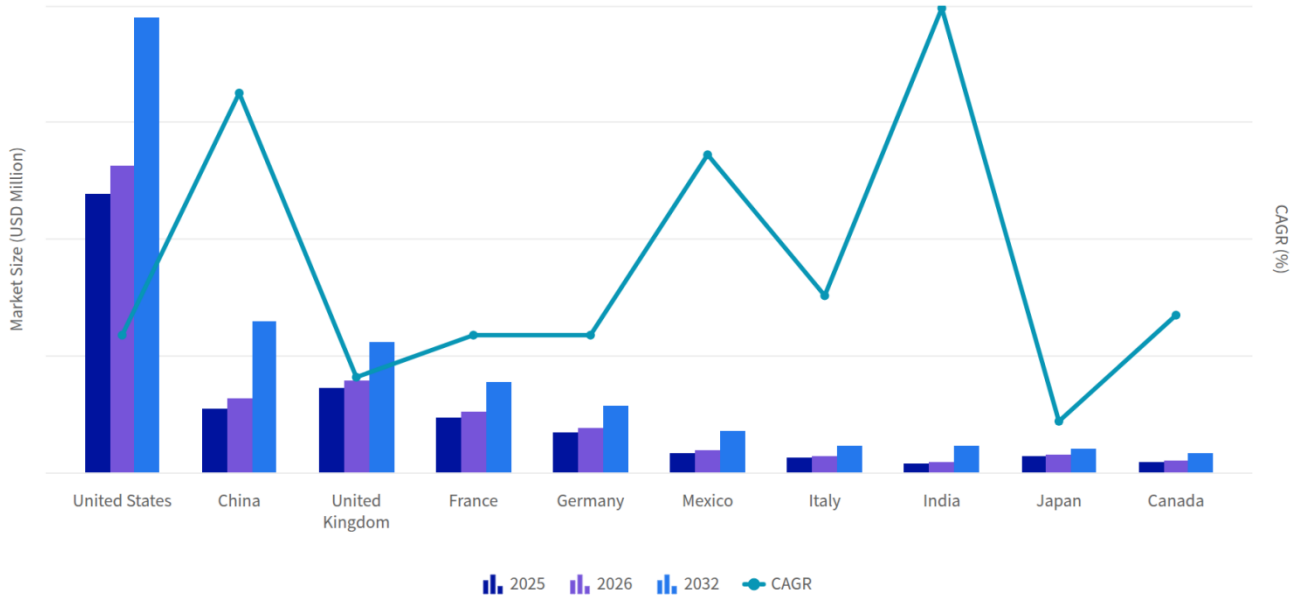

Table 401. Global Nickel-Based Superalloys for Aerospace Market, by Country growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Unallocated / remaining scope	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 402. Global Nickel-Based Superalloys for Aerospace Market Size, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. DFARS 252.225-7009 - Restriction on Acquisition of Certain Articles Containing Specialty Metals
   · The article-containing-metals clause permits specified origins beyond the United States, subject to its conditions and exceptions. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
2. DFARS 252.225-7008 - Restriction on Acquisition of Specialty Metals
   · DFARS xx.xx-xx.xx requires specialty metal delivered under the covered contract to be melted or produced in the United States or its outlying areas. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-specialty-metals.))
3. DFARS 225.872-1 - General
   · The framework lists Canada; that status must still be interpreted under the actual contract's applicable restriction. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-general.))
4. MIDHANI - Indigenous Aero-Engine Material Qualification: CEMILAC Certification
   · The announcement reports the clearance but does not individually name the superalloy grades, limiting its use for grade-specific eligibility conclusions. ([midhani-india.in](https://midhani-india.in/news_marquee/midhani-achieves-major-milestone-in-indigenous-aero-engine-material-qualification-cemilac-certification/))

5. ATI Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
6. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
7. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
8. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
9. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
10. GE Aerospace - 2025 Sustainability Report
    - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
    - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
    - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
11. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
12. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.

13. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
14. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.
15. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.

18.1. United States

Table 403. United States Nickel-Based Superalloys for Aerospace Market Size, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
United States	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 404. United States Nickel-Based Superalloys for Aerospace Market Size, by Product Form, 2017-2040 (USD Million)

Product Form	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Bars, Rods and Profiles	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Billets and Forging Stock	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ingots	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Plate, Sheet, Strip and Foil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Powder	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Tubes and Pipes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Wire	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 405. United States Nickel-Based Superalloys for Aerospace Market Size, by Strengthening Class, 2017-2040 (USD Million)

Strengthening Class	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Dispersion-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Precipitation-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Solid-Solution-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 406. United States Nickel-Based Superalloys for Aerospace Market Size, by Component Application, 2017-2040 (USD Million)

Component Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Breathing Propulsion & Auxiliary Power	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Systems & Equipment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rocket & Spacecraft Propulsion	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Vehicle Structures & Thermal Protection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 407. United States Nickel-Based Superalloys for Aerospace Market Size, by Air-Breathing Propulsion & Auxiliary Power, 2017-2040 (USD Million)

Air-Breathing Propulsion & Auxiliary Power	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combustion & Exhaust Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Compressor Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine Structures & Auxiliary Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Blades & Vanes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Disks & Rotor Hardware	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 408. United States Nickel-Based Superalloys for Aerospace Market Size, by Demand Stage, 2017-2040 (USD Million)

Demand Stage	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Initial Equipment Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Repair, Overhaul & Refurbishment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Replacement & Retrofit Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research, Development & Qualification	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 409. United States Nickel-Based Superalloys for Aerospace Market Size, by Aerospace End Market, 2017-2040 (USD Million)

Aerospace End Market	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Civil & Nonmilitary State Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Guided Missile Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Military Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Space Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 410. United States Nickel-Based Superalloys for Aerospace Market Size, by Buyer Function, 2017-2040 (USD Million)

Buyer Function	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Aerospace Vehicle Manufacturers & Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Component & Subassembly Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine & Propulsion-System Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Maintenance, Repair & Overhaul Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Development Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 411. United States Nickel-Based Superalloys for Aerospace Market Size, by Fulfillment Model, 2017-2040 (USD Million)

Fulfillment Model	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Order-Dedicated Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stock Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 412. United States Nickel-Based Superalloys for Aerospace Market Size, by Supply Channel, 2017-2040 (USD Million)

Supply Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Captive Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent Intermediary Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Producer-Direct Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 413. United States Nickel-Based Superalloys for Aerospace Market Size, by Alloy Grade, 2017-2040 (USD Million)

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ABD-1000AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
ABD-900AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
AD730	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy 718Plus	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy X-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CM247LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CMSX-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hastelloy X	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713C	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 413 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
IN-713LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-738LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
MAR-M xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic 80A	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene 88DT	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
RR1000	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet 720Li	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Waspaloy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. ATI Inc. - 2025 Form 10-K

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC's reported financial/product-category inputs and listed ingot offering constrain the eligible material envelope; the ingot allocation remains assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: AA&S sales of USD xx.xx and its xx.xx% nickel-based/specialty-alloy category anchor the separately adjusted rolled-material envelope.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial jet-engine revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025, supporting purchasing recovery but not identifying price growth or a 2032 material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))

2. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
3. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Narrow-strip supply supports a limited flat-product allocation within the modeled eligible Carpenter envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire is a disclosed supplied form; its eligible monetary weight remains modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.

4. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical xx.xx% slab/bar/billet revenue category constrains the long-stock proxy; its eligible billet split is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported combined stock category provides a proxy anchor, not a separately disclosed bar revenue share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 flat products represented approximately xx.xx% of net product revenue; extrapolation to the eligible Acerinox envelope is modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 wire represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 tubulars represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical product revenue, channel mix and backlog conversion anchor the modeled stock value weight, with explicit scope adjustments.

5. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Casting-alloy activities support an ingot-material equivalent rather than attributing full engine-component revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed metal/billet activities support retaining a forging-stock allocation; the assumed xx.xx% weight is not reported.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported 2025 sales of USD xx.xx and Engine Products aerospace revenues of USD xx.xx commercial and USD xx.xx defense establish the component-cohort scale; USD xx.xx gas-turbine revenue is excluded through an explicit attribution model. These are not material-market revenues. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The segment/end-market revenue table supplies the aerospace and gas-turbine boundaries needed to bridge combined spares activity into an aerospace replacement-material proxy. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial aerospace represented xx.xx% of 2025 company sales, supplying an independent downstream mix comparison rather than a nickel-material allocation weight. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense aerospace represented xx.xx% of 2025 company sales; the paired commercial/defense comparison tests the aviation model while retaining component and material-scope differences. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.

6. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: GE describes repaired/serviceable-part reuse, supporting a counterforce to converting aftermarket activity directly into newly supplied material purchases. Its reported approximately xx.xx% strategic-nickel revert content is not deducted from the terminal-material market. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Commercial repair and component reuse support retaining uncertainty around replacement-related combustion material purchases. The selected procurement-intensity offset remains an assumption, not a measured avoided-purchase percentage. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
7. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US import primitive before domestic/captive coverage adjustment.
8. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: US customer revenue constrains the domestic-material bridge, with product-scope exclusions.

9. Special Metals - Tech Center
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised ingot supply establishes a PCC material-form crosswalk, not its sales weight.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised billet supply supports the forging-stock category mapping within the inherited PCC envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised bar supply supports classification only; the monetary coefficient is an assumption.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Plate, sheet and strip offerings support a distinct flat-product allocation premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire availability supports the material-form crosswalk without establishing revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Tubing availability supports the material-form crosswalk without establishing revenue.
10. DPC Holdings Limited - Registration Statement with 2025 Financial Statements
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing separates ingots from component sales and describes external supply and xx.xx% internal superalloy sourcing, contradicting the inherited xx.xx% captive parameter.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
11. Acerinox - Results FY 2025
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned US long-product expansion supports the relative conventional-long-material premise; investment is not recognized as sales.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately USD xx.xx of planned platform investment includes expansion of the long-products offering, informing the bars forecast premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace demand and planned long-product diversification support testing a relative mix shift without assuming flat-product contraction.

12. Haynes International - HAYNES 282
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Powder is offered alongside conventional forms for HAYNES xx.xx supporting nonexclusive form classification, not an observed sales allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
13. CMA - Anticipated Acquisition of Haynes International by Acerinox: Full Text Decision
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct customer evidence in paragraphs xx.xx-xx.xx supports separate flat/long purchasing pools; no published market-share table is used.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Shape-specific purchasing supports a distinct long-stock allocation model without proving a separate competitive market for billet.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.

14. Haynes International - HAYNES 230
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
15. Carpenter Technology - Advanced Materials for Aerospace Motor & Engines
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))
16. Elementum 3D - Metal Alloy Additive Manufacturing Colorado
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed. ([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed. ([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))
17. NASA - NASA-Developed Printable Metal Can Take the Heat
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake. ([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake. ([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

18. Carpenter Technology - Lighter, Faster, Stronger Metallurgy for Defense, July 2025

    · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
    ([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

    · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
    ([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

19. Special Metals - Aerospace

    · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight.
    ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

    · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight.
    ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

    · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy xx.xx; no sales weight is disclosed.
    ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

    · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy X-xx.xx; no current sales quantity is disclosed.
    ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

    · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Waspaloy; no sales weight is disclosed.
    ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

20. Boeing - BDS Terms and Conditions Guide, D607 Material Substitution Prohibition, November 15, 2013
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: D607 prohibits unauthorized material substitutions while recognizing specified alternatives. It constrains assumptions about frictionless cross-class substitution, without quantifying adoption delays. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization requirements qualify assumptions about precipitation-family substitution opportunities; the clause does not prove future purchases or a class-growth premium. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause prohibits unauthorized substitutions where contractually applicable. It constrains the adoption interpretation but does not establish approval prevalence or a numerical adoption rate. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific material authorization is a counterweight to treating a named offering as immediately substitutable production material. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization limits interpretation of the assumed adoption multiplier; it does not directly establish powder sales. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))

21. Precision Castparts Corp. - Fiscal 2015 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.

22. NASA - Chapter 2: Aerospace Materials Characteristics

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

23. ESA - ESA Space Environment Report 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
24. NASA and Superalloys: A Customer, a Participant, and a Referee
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
25. VDM Metals - Alloys for the Aerospace Industry
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
26. Carpenter Technology - Business Segments
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))

27. Howmet Aerospace - 2025 Annual Report, Letter to Shareholders

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% combined aerospace and gas-turbine spares revenue constrains the distinction between initial-production and spare-component activity; material and destination adjustments remain modeled. ([howmet.com](https://www.howmet.com/annualreport/))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed combined spares proportion supplies the replacement proxy; approximately xx.xx% commercial aerospace engine-spares growth is historical counterevidence against assuming weak aftermarket activity. ([howmet.com](https://www.howmet.com/annualreport/))

28. GE Aerospace - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment and services costs provide commercial budget anchors for the common material-value denominator; assumed eligible-material fractions prevent full equipment or service value from entering the allocation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Services include spare parts and maintenance activity, supporting an explicit new-article versus restoration attribution rather than equating services revenue with replacement-material purchases. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported USD xx.xx services cost anchors the restoration-material bridge; the restoration allocation and direct eligible-material fraction are assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Total funded R&D of USD xx.xx supplies a development-budget proxy, not observed nickel-material purchasing; only an assumed eligible-material fraction is used. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.

29. Rolls-Royce Holdings Plc - 2025 Full Year Results

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2028 shop-visit target is below the reported 2025 total despite prospective fleet growth, qualifying any automatic conversion of fleet expansion into proportionate maintenance-material purchasing.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The divergence between 2025 engine deliveries and shop visits independently challenges a uniform new-engine-led material forecast; no service revenue is included in the numerator.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Observed engine-delivery and shop-visit activity supports separate new-program and replacement-demand assumptions, not a proportional material-purchase conversion.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

30. UKRI - Accelerating Manufacturing Readiness level of ABD-1000AM for AM of high temperature aerospace components (AMRAM1000)
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The Alloyed-led project has xx.xx of funding and an April 2025-October 2026 funded period. This independently establishes bounded development activity, not annual material sales or recurring production purchases. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
31. Safran - FY 2025 Results and Investor Update, February 13, 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))

32. Airbus - Full-Year 2025 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 deliveries by aircraft family provide the starting activity comparison for the initial-production forecast; aircraft delivery value is not included in the material numerator. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx% decline in 2025 self-financed R&D is counterevidence to uniform development-budget acceleration and supports a restrained, explicitly assumed development-purchasing scenario. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.

33. Airbus - Half-Year 2026 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 update retained the A320-family, A350 and other production-rate targets, providing a dated commercial constraint on the initial-production activity scenario rather than proof of future material orders. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: First-half 2026 self-financed R&D of EUR xx.xx versus EUR xx.xx provides a modest-growth countercheck for the assumed development-project activity path; the budget is not material-market revenue. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))

34. RTX Corporation - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

35. Federal Reserve Bank of St. Louis - Annual USD/GBP Exchange Rate, AEXUSUK
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
36. L3Harris Technologies, Inc. - Fiscal 2025 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
37. FAA Aerospace Forecast Fiscal Years 2025-2045 - Commercial Space
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated official low/high scenarios provide FY2032 licensed launch/reentry activity bounds. Their U.S.-licensed scope and treatment of reusable vehicles prevent direct conversion into Global material revenue. ([faa.gov](https://www.faa.gov/data_research/aviation/aerospace_forecasts/2025-commercial-space.pdf))
38. ICAO - Convention on International Civil Aviation, Ninth Edition
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))

39. DFARS 252.225-7009 - Restriction on Acquisition of Certain Articles Containing Specialty Metals
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
40. Aubert & Duval - Space Industry Metallurgical Solutions
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
41. Aubert & Duval - Metallurgical Solutions for the Defense Industry, June 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
42. Berkshire Hathaway Inc. - 2025 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.

43. Lufthansa Group Annual Report 2025 - MRO business segment
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
44. Oliver Wyman - Global Fleet And MRO Market Forecast 2026-2036: Key Trends
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
45. German Aerospace Center (DLR) - Financing
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
46. Federal Aviation Administration - Parts Manufacturer Approval (PMA): Design Approval
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.

47. Rolled Alloys - E-Services Stocking Programs
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
48. Boeing BDS Terms and Conditions Guide - D604 Raw Material Risk Mitigation
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
49. Carpenter Technology Corporation - Second Quarter Fiscal 2026 Earnings Call Presentation, January 29, 2026
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation distinguishes specialized non-LTA business from a conventional spot market, countering automatic classification of transactional sales as stock.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Three additional aerospace LTAs and xx.xx% sequential commercial-aerospace bookings growth inform the reservation hypothesis, but do not measure its modeled magnitude.
50. Precision Castparts Corp. - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.

51. Howmet Aerospace - United States Locations
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
52. ATI Inc. - 2024 Annual Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New sales commitments through 2040, including amounts expected during the remainder of the decade and predominantly involving jet-engine nickel alloys, inform the direct-program forecast premise without being counted as realized sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% of fiscal-2024 plate volume went to independent service centers, providing a historical comparison that cautions against assuming generalized intermediary displacement.
53. Alloyed - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.

54. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 aerospace realization and revenue provide the common monetary calibration for this modeled grade; neither is a grade-specific sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace material realization supplies a price-scale input, with modeled year and product-mix adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization calibrates the assumed blended material price, not this grade's observed revenue. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace realization provides a shared monetary comparison for the assumed grade price. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported eight-to-ten-year aerospace application-introduction periods constrain interpretation of the seven-year adoption forecast. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace application-introduction periods provide an adoption-delay counterweight, not a forecast sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
55. European Commission CORDIS - Welding Metallurgy and Cracking in Superalloys: Reporting
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical all-sector tonnage discussion is only a dominance cross-check; it cannot establish current aerospace monetary share. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies 718Plus separately from ordinary xx.xx supporting identity separation without supplying a current sales weight. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
56. Special Metals - Alloy Surcharge Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: August-October 2026 grade surcharges provide a differentiated cost-exposure check, not full invoice prices or observed 2032 prices. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx surcharge sequence independently qualifies a uniform price assumption; it is not substituted for a material selling price. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The grade-specific surcharge listing is a commercial cost comparison, not an observed Global grade realization. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))

57. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current-and-past supplier identity mapping only; not proof of 2025 aerospace sales or the modeled volume. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: CMSX-xx.xx is separately identified; the material-value weight remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current sales are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713C is listed separately from IN-713LC; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713LC is listed separately from IN-713C; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx identity mapping only; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-738LC is separately identified; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current aerospace tonnes are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx appears in a current-and-past identification list; this does not establish recurring aerospace production sales. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: MAR-M xx.xx is identified separately from CM247LC; monetary weights remain modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PWA xx.xx is separately identified; no attributable sales value is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; current commercial scale remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; no current grade-specific material sales are disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Udimet xx.xx appears in the supplier's current-and-past identities; aerospace attribution is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

58. GE Aerospace - Safety First: A Retiring GE Aerospace Materials Engineer Made Protecting Lives His Mission
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
59. Aubert & Duval - AD730: Ni-Based Superalloy for High Temperature Applications
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
60. University of Portsmouth - Improved Creep-Fatigue-Oxidation Resistance in Gas Turbine Disc Materials: REF Impact Case Study
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))

61. Influence of Long Term Exposure in Air on Microstructure, Surface Stability and Mechanical Properties of UDIMET 720LI

    · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The aerospace-industry publication distinguishes conventional Udimet xx.xx from its 720Li derivative; it does not establish a current monetary allocation. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

    · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The publication independently supports the 720Li identity and aircraft-engine-disc category, without supplying current sales. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

62. NASA Contractor Report 174639 - Literature Survey on Oxidations and Fatigue Lives at Elevated Temperatures

    · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical institutional material identification is a legacy-category anchor only; it does not demonstrate current aerospace material sales. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

63. America Makes - 5566.002 Proliferation of Nickel Superalloy Material Datasets for Powder Bed Fusion Additive Manufacturing

    · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))

    · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))

64. GE Aerospace - Fourth Quarter 2025 Earnings Presentation

    · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 commercial-engine delivery growth supplies a near-term demand cross-check, not a grade-specific purchasing or seven-year growth observation. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

    · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aggregate commercial and defense delivery growth constrains the commercial-demand scenario without establishing this grade's attributable consumption. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

    · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported defense-engine delivery growth is a demand-exposure check only; the PWA xx.xx activity factor remains assumed. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

18.2. United Kingdom

Table 414. United Kingdom Nickel-Based Superalloys for Aerospace Market Size, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 415. United Kingdom Nickel-Based Superalloys for Aerospace Market Size, by Product Form, 2017-2040 (USD Million)

Product Form	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Bars, Rods and Profiles	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Billets and Forging Stock	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ingots	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Plate, Sheet, Strip and Foil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Powder	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Tubes and Pipes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Wire	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 416. United Kingdom Nickel-Based Superalloys for Aerospace Market Size, by Strengthening Class, 2017-2040 (USD Million)

Strengthening Class	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Dispersion-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Precipitation-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Solid-Solution-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 417. United Kingdom Nickel-Based Superalloys for Aerospace Market Size, by Component Application, 2017-2040 (USD Million)

Component Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Breathing Propulsion & Auxiliary Power	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Systems & Equipment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rocket & Spacecraft Propulsion	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Vehicle Structures & Thermal Protection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 418. United Kingdom Nickel-Based Superalloys for Aerospace Market Size, by Air-Breathing Propulsion & Auxiliary Power, 2017-2040 (USD Million)

Air-Breathing Propulsion & Auxiliary Power	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combustion & Exhaust Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Compressor Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine Structures & Auxiliary Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Blades & Vanes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Disks & Rotor Hardware	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 419. United Kingdom Nickel-Based Superalloys for Aerospace Market Size, by Demand Stage, 2017-2040 (USD Million)

Demand Stage	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Initial Equipment Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Repair, Overhaul & Refurbishment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Replacement & Retrofit Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research, Development & Qualification	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 420. United Kingdom Nickel-Based Superalloys for Aerospace Market Size, by Aerospace End Market, 2017-2040 (USD Million)

Aerospace End Market	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Civil & Nonmilitary State Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Guided Missile Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Military Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Space Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 421. United Kingdom Nickel-Based Superalloys for Aerospace Market Size, by Buyer Function, 2017-2040 (USD Million)

Buyer Function	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Aerospace Vehicle Manufacturers & Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Component & Subassembly Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine & Propulsion-System Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Maintenance, Repair & Overhaul Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Development Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 422. United Kingdom Nickel-Based Superalloys for Aerospace Market Size, by Fulfillment Model, 2017-2040 (USD Million)

Fulfillment Model	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Order-Dedicated Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stock Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 423. United Kingdom Nickel-Based Superalloys for Aerospace Market Size, by Supply Channel, 2017-2040 (USD Million)

Supply Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Captive Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent Intermediary Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Producer-Direct Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 424. United Kingdom Nickel-Based Superalloys for Aerospace Market Size, by Alloy Grade, 2017-2040 (USD Million)

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ABD-1000AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
ABD-900AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 424 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
AD730	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy 718Plus	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy X-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CM247LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CMSX-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hastelloy X	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713C	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-738LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
MAR-M xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic 80A	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene 88DT	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 424 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
RR1000	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet 720Li	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Waspaloy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. ATI Inc. - 2025 Form 10-K

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC's reported financial/product-category inputs and listed ingot offering constrain the eligible material envelope; the ingot allocation remains assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: AA&S sales of USD xx.xx and its xx.xx% nickel-based/specialty-alloy category anchor the separately adjusted rolled-material envelope.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial jet-engine revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025, supporting purchasing recovery but not identifying price growth or a 2032 material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))

2. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
3. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Narrow-strip supply supports a limited flat-product allocation within the modeled eligible Carpenter envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire is a disclosed supplied form; its eligible monetary weight remains modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.

4. Haynes International, Inc. - 2023 Form 10-K

- Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
- Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
- Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
- Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
- Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical xx.xx% slab/bar/billet revenue category constrains the long-stock proxy; its eligible billet split is assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported combined stock category provides a proxy anchor, not a separately disclosed bar revenue share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 flat products represented approximately xx.xx% of net product revenue; extrapolation to the eligible Acerinox envelope is modeled.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 wire represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 tubulars represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical product revenue, channel mix and backlog conversion anchor the modeled stock value weight, with explicit scope adjustments.

5. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Casting-alloy activities support an ingot-material equivalent rather than attributing full engine-component revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed metal/billet activities support retaining a forging-stock allocation; the assumed xx.xx% weight is not reported.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported 2025 sales of USD xx.xx and Engine Products aerospace revenues of USD xx.xx commercial and USD xx.xx defense establish the component-cohort scale; USD xx.xx gas-turbine revenue is excluded through an explicit attribution model. These are not material-market revenues. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The segment/end-market revenue table supplies the aerospace and gas-turbine boundaries needed to bridge combined spares activity into an aerospace replacement-material proxy. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial aerospace represented xx.xx% of 2025 company sales, supplying an independent downstream mix comparison rather than a nickel-material allocation weight. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense aerospace represented xx.xx% of 2025 company sales; the paired commercial/defense comparison tests the aviation model while retaining component and material-scope differences. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.

6. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: GE describes repaired/serviceable-part reuse, supporting a counterforce to converting aftermarket activity directly into newly supplied material purchases. Its reported approximately xx.xx% strategic-nickel revert content is not deducted from the terminal-material market. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Commercial repair and component reuse support retaining uncertainty around replacement-related combustion material purchases. The selected procurement-intensity offset remains an assumption, not a measured avoided-purchase percentage. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
7. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: UK import primitive.
8. Special Metals - Tech Center
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised ingot supply establishes a PCC material-form crosswalk, not its sales weight.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised billet supply supports the forging-stock category mapping within the inherited PCC envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised bar supply supports classification only; the monetary coefficient is an assumption.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Plate, sheet and strip offerings support a distinct flat-product allocation premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire availability supports the material-form crosswalk without establishing revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Tubing availability supports the material-form crosswalk without establishing revenue.

9. DPC Holdings Limited - Registration Statement with 2025 Financial Statements
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing separates ingots from component sales and describes external supply and xx.xx% internal superalloy sourcing, contradicting the inherited xx.xx% captive parameter.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
10. Acerinox - Results FY 2025
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned US long-product expansion supports the relative conventional-long-material premise; investment is not recognized as sales.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately USD xx.xx of planned platform investment includes expansion of the long-products offering, informing the bars forecast premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace demand and planned long-product diversification support testing a relative mix shift without assuming flat-product contraction.
11. Haynes International - HAYNES 282
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Powder is offered alongside conventional forms for HAYNES xx.xx supporting nonexclusive form classification, not an observed sales allocation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))

12. CMA - Anticipated Acquisition of Haynes International by Acerinox: Full Text Decision
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct customer evidence in paragraphs xx.xx-xx.xx supports separate flat/long purchasing pools; no published market-share table is used.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Shape-specific purchasing supports a distinct long-stock allocation model without proving a separate competitive market for billet.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
13. Haynes International - HAYNES 230
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))

14. Carpenter Technology - Advanced Materials for Aerospace Motor & Engines

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation.
([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation.
([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))

15. Elementum 3D - Metal Alloy Additive Manufacturing Colorado

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed.
([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed.
([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))

16. NASA - NASA-Developed Printable Metal Can Take the Heat

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake.
([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake.
([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

17. Carpenter Technology - Lighter, Faster, Stronger Metallurgy for Defense, July 2025

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

18. Special Metals - Aerospace
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy xx.xx; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy X-xx.xx; no current sales quantity is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Waspaloy; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

19. Boeing - BDS Terms and Conditions Guide, D607 Material Substitution Prohibition, November 15, 2013
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: D607 prohibits unauthorized material substitutions while recognizing specified alternatives. It constrains assumptions about frictionless cross-class substitution, without quantifying adoption delays. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization requirements qualify assumptions about precipitation-family substitution opportunities; the clause does not prove future purchases or a class-growth premium. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause prohibits unauthorized substitutions where contractually applicable. It constrains the adoption interpretation but does not establish approval prevalence or a numerical adoption rate. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific material authorization is a counterweight to treating a named offering as immediately substitutable production material. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization limits interpretation of the assumed adoption multiplier; it does not directly establish powder sales. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))

20. Precision Castparts Corp. - Fiscal 2015 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
21. NASA - Chapter 2: Aerospace Materials Characteristics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

22. ESA - ESA Space Environment Report 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
23. NASA and Superalloys: A Customer, a Participant, and a Referee
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
24. VDM Metals - Alloys for the Aerospace Industry
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
25. Carpenter Technology - Business Segments
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))

26. Howmet Aerospace - 2025 Annual Report, Letter to Shareholders

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% combined aerospace and gas-turbine spares revenue constrains the distinction between initial-production and spare-component activity; material and destination adjustments remain modeled. ([howmet.com](https://www.howmet.com/annualreport/))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed combined spares proportion supplies the replacement proxy; approximately xx.xx% commercial aerospace engine-spares growth is historical counterevidence against assuming weak aftermarket activity. ([howmet.com](https://www.howmet.com/annualreport/))

27. GE Aerospace - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment and services costs provide commercial budget anchors for the common material-value denominator; assumed eligible-material fractions prevent full equipment or service value from entering the allocation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Services include spare parts and maintenance activity, supporting an explicit new-article versus restoration attribution rather than equating services revenue with replacement-material purchases. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported USD xx.xx services cost anchors the restoration-material bridge; the restoration allocation and direct eligible-material fraction are assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Total funded R&D of USD xx.xx supplies a development-budget proxy, not observed nickel-material purchasing; only an assumed eligible-material fraction is used. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.

28. Rolls-Royce Holdings Plc - 2025 Full Year Results

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2028 shop-visit target is below the reported 2025 total despite prospective fleet growth, qualifying any automatic conversion of fleet expansion into proportionate maintenance-material purchasing.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The divergence between 2025 engine deliveries and shop visits independently challenges a uniform new-engine-led material forecast; no service revenue is included in the numerator.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Observed engine-delivery and shop-visit activity supports separate new-program and replacement-demand assumptions, not a proportional material-purchase conversion.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

29. UKRI - Accelerating Manufacturing Readiness level of ABD-1000AM for AM of high temperature aerospace components (AMRAM1000)
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The Alloyed-led project has xx.xx of funding and an April 2025-October 2026 funded period. This independently establishes bounded development activity, not annual material sales or recurring production purchases. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
30. Safran - FY 2025 Results and Investor Update, February 13, 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))

31. Airbus - Full-Year 2025 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 deliveries by aircraft family provide the starting activity comparison for the initial-production forecast; aircraft delivery value is not included in the material numerator. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx% decline in 2025 self-financed R&D is counterevidence to uniform development-budget acceleration and supports a restrained, explicitly assumed development-purchasing scenario. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.

32. Airbus - Half-Year 2026 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 update retained the A320-family, A350 and other production-rate targets, providing a dated commercial constraint on the initial-production activity scenario rather than proof of future material orders. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: First-half 2026 self-financed R&D of EUR xx.xx versus EUR xx.xx provides a modest-growth countercheck for the assumed development-project activity path; the budget is not material-market revenue. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))

33. RTX Corporation - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

34. Federal Reserve Bank of St. Louis - Annual USD/GBP Exchange Rate, AEXUSUK
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
35. L3Harris Technologies, Inc. - Fiscal 2025 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
36. FAA Aerospace Forecast Fiscal Years 2025-2045 - Commercial Space
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated official low/high scenarios provide FY2032 licensed launch/reentry activity bounds. Their U.S.-licensed scope and treatment of reusable vehicles prevent direct conversion into Global material revenue. ([faa.gov](https://www.faa.gov/data_research/aviation/aerospace_forecasts/2025-commercial-space.pdf))
37. ICAO - Convention on International Civil Aviation, Ninth Edition
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))

38. DFARS 252.225-7009 - Restriction on Acquisition of Certain Articles Containing Specialty Metals
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
39. Aubert & Duval - Space Industry Metallurgical Solutions
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
40. Aubert & Duval - Metallurgical Solutions for the Defense Industry, June 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
41. Berkshire Hathaway Inc. - 2025 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.

42. Lufthansa Group Annual Report 2025 - MRO business segment
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
43. Oliver Wyman - Global Fleet And MRO Market Forecast 2026-2036: Key Trends
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
44. German Aerospace Center (DLR) - Financing
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
45. Federal Aviation Administration - Parts Manufacturer Approval (PMA): Design Approval
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.

46. Rolled Alloys - E-Services Stocking Programs
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
47. Boeing BDS Terms and Conditions Guide - D604 Raw Material Risk Mitigation
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
48. Carpenter Technology Corporation - Second Quarter Fiscal 2026 Earnings Call Presentation, January 29, 2026
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation distinguishes specialized non-LTA business from a conventional spot market, countering automatic classification of transactional sales as stock.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Three additional aerospace LTAs and xx.xx% sequential commercial-aerospace bookings growth inform the reservation hypothesis, but do not measure its modeled magnitude.
49. Precision Castparts Corp. - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.

50. Howmet Aerospace - United States Locations
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
51. ATI Inc. - 2024 Annual Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New sales commitments through 2040, including amounts expected during the remainder of the decade and predominantly involving jet-engine nickel alloys, inform the direct-program forecast premise without being counted as realized sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% of fiscal-2024 plate volume went to independent service centers, providing a historical comparison that cautions against assuming generalized intermediary displacement.
52. Alloyed - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.

53. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 aerospace realization and revenue provide the common monetary calibration for this modeled grade; neither is a grade-specific sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace material realization supplies a price-scale input, with modeled year and product-mix adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization calibrates the assumed blended material price, not this grade's observed revenue. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace realization provides a shared monetary comparison for the assumed grade price. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported eight-to-ten-year aerospace application-introduction periods constrain interpretation of the seven-year adoption forecast. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace application-introduction periods provide an adoption-delay counterweight, not a forecast sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
54. European Commission CORDIS - Welding Metallurgy and Cracking in Superalloys: Reporting
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical all-sector tonnage discussion is only a dominance cross-check; it cannot establish current aerospace monetary share. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies 718Plus separately from ordinary xx.xx supporting identity separation without supplying a current sales weight. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
55. Special Metals - Alloy Surcharge Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: August-October 2026 grade surcharges provide a differentiated cost-exposure check, not full invoice prices or observed 2032 prices. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx surcharge sequence independently qualifies a uniform price assumption; it is not substituted for a material selling price. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The grade-specific surcharge listing is a commercial cost comparison, not an observed Global grade realization. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))

56. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current-and-past supplier identity mapping only; not proof of 2025 aerospace sales or the modeled volume. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: CMSX-xx.xx is separately identified; the material-value weight remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current sales are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713C is listed separately from IN-713LC; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713LC is listed separately from IN-713C; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx identity mapping only; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-738LC is separately identified; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current aerospace tonnes are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx appears in a current-and-past identification list; this does not establish recurring aerospace production sales. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: MAR-M xx.xx is identified separately from CM247LC; monetary weights remain modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PWA xx.xx is separately identified; no attributable sales value is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; current commercial scale remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; no current grade-specific material sales are disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Udimet xx.xx appears in the supplier's current-and-past identities; aerospace attribution is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

57. GE Aerospace - Safety First: A Retiring GE Aerospace Materials Engineer Made Protecting Lives His Mission
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
58. Aubert & Duval - AD730: Ni-Based Superalloy for High Temperature Applications
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
59. University of Portsmouth - Improved Creep-Fatigue-Oxidation Resistance in Gas Turbine Disc Materials: REF Impact Case Study
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))

60. Influence of Long Term Exposure in Air on Microstructure, Surface Stability and Mechanical Properties of UDIMET 720LI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The aerospace-industry publication distinguishes conventional Udimet xx.xx from its 720Li derivative; it does not establish a current monetary allocation. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The publication independently supports the 720Li identity and aircraft-engine-disc category, without supplying current sales. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))
61. NASA Contractor Report 174639 - Literature Survey on Oxidations and Fatigue Lives at Elevated Temperatures
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical institutional material identification is a legacy-category anchor only; it does not demonstrate current aerospace material sales. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
62. America Makes - 5566.002 Proliferation of Nickel Superalloy Material Datasets for Powder Bed Fusion Additive Manufacturing
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))
63. GE Aerospace - Fourth Quarter 2025 Earnings Presentation
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 commercial-engine delivery growth supplies a near-term demand cross-check, not a grade-specific purchasing or seven-year growth observation. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aggregate commercial and defense delivery growth constrains the commercial-demand scenario without establishing this grade's attributable consumption. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported defense-engine delivery growth is a demand-exposure check only; the PWA xx.xx activity factor remains assumed. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

18.3. China

Table 425. China Nickel-Based Superalloys for Aerospace Market Size, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
China	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 426. China Nickel-Based Superalloys for Aerospace Market Size, by Product Form, 2017-2040 (USD Million)

Product Form	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Bars, Rods and Profiles	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Billets and Forging Stock	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ingots	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Plate, Sheet, Strip and Foil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Powder	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Tubes and Pipes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Wire	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 427. China Nickel-Based Superalloys for Aerospace Market Size, by Strengthening Class, 2017-2040 (USD Million)

Strengthening Class	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Dispersion-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Precipitation-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Solid-Solution-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 428. China Nickel-Based Superalloys for Aerospace Market Size, by Component Application, 2017-2040 (USD Million)

Component Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Breathing Propulsion & Auxiliary Power	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Systems & Equipment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rocket & Spacecraft Propulsion	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Vehicle Structures & Thermal Protection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 429. China Nickel-Based Superalloys for Aerospace Market Size, by Air-Breathing Propulsion & Auxiliary Power, 2017-2040 (USD Million)

Air-Breathing Propulsion & Auxiliary Power	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combustion & Exhaust Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Compressor Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine Structures & Auxiliary Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Blades & Vanes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Disks & Rotor Hardware	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 430. China Nickel-Based Superalloys for Aerospace Market Size, by Demand Stage, 2017-2040 (USD Million)

Demand Stage	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Initial Equipment Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Repair, Overhaul & Refurbishment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Replacement & Retrofit Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research, Development & Qualification	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 431. China Nickel-Based Superalloys for Aerospace Market Size, by Aerospace End Market, 2017-2040 (USD Million)

Aerospace End Market	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Civil & Nonmilitary State Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Guided Missile Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Military Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Space Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 432. China Nickel-Based Superalloys for Aerospace Market Size, by Buyer Function, 2017-2040 (USD Million)

Buyer Function	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Aerospace Vehicle Manufacturers & Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Component & Subassembly Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine & Propulsion-System Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Maintenance, Repair & Overhaul Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Development Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 433. China Nickel-Based Superalloys for Aerospace Market Size, by Fulfillment Model, 2017-2040 (USD Million)

Fulfillment Model	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Order-Dedicated Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stock Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 434. China Nickel-Based Superalloys for Aerospace Market Size, by Supply Channel, 2017-2040 (USD Million)

Supply Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Captive Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent Intermediary Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Producer-Direct Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 435. China Nickel-Based Superalloys for Aerospace Market Size, by Alloy Grade, 2017-2040 (USD Million)

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ABD-1000AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
ABD-900AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 435 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
AD730	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy 718Plus	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy X-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CM247LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CMSX-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hastelloy X	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713C	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-738LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
MAR-M xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic 80A	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene 88DT	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 435 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
RR1000	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet 720Li	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Waspaloy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. ATI Inc. - 2025 Form 10-K

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC's reported financial/product-category inputs and listed ingot offering constrain the eligible material envelope; the ingot allocation remains assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: AA&S sales of USD xx.xx and its xx.xx% nickel-based/specialty-alloy category anchor the separately adjusted rolled-material envelope.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial jet-engine revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025, supporting purchasing recovery but not identifying price growth or a 2032 material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))

2. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
3. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Narrow-strip supply supports a limited flat-product allocation within the modeled eligible Carpenter envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire is a disclosed supplied form; its eligible monetary weight remains modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.

4. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical xx.xx% slab/bar/billet revenue category constrains the long-stock proxy; its eligible billet split is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported combined stock category provides a proxy anchor, not a separately disclosed bar revenue share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 flat products represented approximately xx.xx% of net product revenue; extrapolation to the eligible Acerinox envelope is modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 wire represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 tubulars represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical product revenue, channel mix and backlog conversion anchor the modeled stock value weight, with explicit scope adjustments.

5. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Casting-alloy activities support an ingot-material equivalent rather than attributing full engine-component revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed metal/billet activities support retaining a forging-stock allocation; the assumed xx.xx% weight is not reported.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported 2025 sales of USD xx.xx and Engine Products aerospace revenues of USD xx.xx commercial and USD xx.xx defense establish the component-cohort scale; USD xx.xx gas-turbine revenue is excluded through an explicit attribution model. These are not material-market revenues. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The segment/end-market revenue table supplies the aerospace and gas-turbine boundaries needed to bridge combined spares activity into an aerospace replacement-material proxy. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial aerospace represented xx.xx% of 2025 company sales, supplying an independent downstream mix comparison rather than a nickel-material allocation weight. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense aerospace represented xx.xx% of 2025 company sales; the paired commercial/defense comparison tests the aviation model while retaining component and material-scope differences. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.

6. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: GE describes repaired/serviceable-part reuse, supporting a counterforce to converting aftermarket activity directly into newly supplied material purchases. Its reported approximately xx.xx% strategic-nickel revert content is not deducted from the terminal-material market. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Commercial repair and component reuse support retaining uncertainty around replacement-related combustion material purchases. The selected procurement-intensity offset remains an assumption, not a measured avoided-purchase percentage. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
7. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: China import primitive before aerospace attribution and domestic coverage.
8. Special Metals - Tech Center
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised ingot supply establishes a PCC material-form crosswalk, not its sales weight.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised billet supply supports the forging-stock category mapping within the inherited PCC envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised bar supply supports classification only; the monetary coefficient is an assumption.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Plate, sheet and strip offerings support a distinct flat-product allocation premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire availability supports the material-form crosswalk without establishing revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Tubing availability supports the material-form crosswalk without establishing revenue.

9. DPC Holdings Limited - Registration Statement with 2025 Financial Statements
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing separates ingots from component sales and describes external supply and xx.xx% internal superalloy sourcing, contradicting the inherited xx.xx% captive parameter.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
10. Acerinox - Results FY 2025
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned US long-product expansion supports the relative conventional-long-material premise; investment is not recognized as sales.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately USD xx.xx of planned platform investment includes expansion of the long-products offering, informing the bars forecast premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace demand and planned long-product diversification support testing a relative mix shift without assuming flat-product contraction.
11. Haynes International - HAYNES 282
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Powder is offered alongside conventional forms for HAYNES xx.xx supporting nonexclusive form classification, not an observed sales allocation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))

12. CMA - Anticipated Acquisition of Haynes International by Acerinox: Full Text Decision
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct customer evidence in paragraphs xx.xx-xx.xx supports separate flat/long purchasing pools; no published market-share table is used.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Shape-specific purchasing supports a distinct long-stock allocation model without proving a separate competitive market for billet.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
13. Haynes International - HAYNES 230
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))

14. Carpenter Technology - Advanced Materials for Aerospace Motor & Engines

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation.
([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation.
([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))

15. Elementum 3D - Metal Alloy Additive Manufacturing Colorado

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed.
([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed.
([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))

16. NASA - NASA-Developed Printable Metal Can Take the Heat

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake.
([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake.
([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

17. Carpenter Technology - Lighter, Faster, Stronger Metallurgy for Defense, July 2025

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

18. Special Metals - Aerospace
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy xx.xx; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy X-xx.xx; no current sales quantity is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Waspaloy; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

19. Boeing - BDS Terms and Conditions Guide, D607 Material Substitution Prohibition, November 15, 2013
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: D607 prohibits unauthorized material substitutions while recognizing specified alternatives. It constrains assumptions about frictionless cross-class substitution, without quantifying adoption delays. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization requirements qualify assumptions about precipitation-family substitution opportunities; the clause does not prove future purchases or a class-growth premium. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause prohibits unauthorized substitutions where contractually applicable. It constrains the adoption interpretation but does not establish approval prevalence or a numerical adoption rate. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific material authorization is a counterweight to treating a named offering as immediately substitutable production material. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization limits interpretation of the assumed adoption multiplier; it does not directly establish powder sales. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))

20. Precision Castparts Corp. - Fiscal 2015 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
21. NASA - Chapter 2: Aerospace Materials Characteristics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

22. ESA - ESA Space Environment Report 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
23. NASA and Superalloys: A Customer, a Participant, and a Referee
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
24. VDM Metals - Alloys for the Aerospace Industry
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
25. Carpenter Technology - Business Segments
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))

26. Howmet Aerospace - 2025 Annual Report, Letter to Shareholders

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% combined aerospace and gas-turbine spares revenue constrains the distinction between initial-production and spare-component activity; material and destination adjustments remain modeled. ([howmet.com](https://www.howmet.com/annualreport/))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed combined spares proportion supplies the replacement proxy; approximately xx.xx% commercial aerospace engine-spares growth is historical counterevidence against assuming weak aftermarket activity. ([howmet.com](https://www.howmet.com/annualreport/))

27. GE Aerospace - 2025 Form 10-K

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment and services costs provide commercial budget anchors for the common material-value denominator; assumed eligible-material fractions prevent full equipment or service value from entering the allocation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Services include spare parts and maintenance activity, supporting an explicit new-article versus restoration attribution rather than equating services revenue with replacement-material purchases. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported USD xx.xx services cost anchors the restoration-material bridge; the restoration allocation and direct eligible-material fraction are assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Total funded R&D of USD xx.xx supplies a development-budget proxy, not observed nickel-material purchasing; only an assumed eligible-material fraction is used. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.

28. Rolls-Royce Holdings Plc - 2025 Full Year Results

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2028 shop-visit target is below the reported 2025 total despite prospective fleet growth, qualifying any automatic conversion of fleet expansion into proportionate maintenance-material purchasing.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The divergence between 2025 engine deliveries and shop visits independently challenges a uniform new-engine-led material forecast; no service revenue is included in the numerator.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Observed engine-delivery and shop-visit activity supports separate new-program and replacement-demand assumptions, not a proportional material-purchase conversion.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

29. UKRI - Accelerating Manufacturing Readiness level of ABD-1000AM for AM of high temperature aerospace components (AMRAM1000)
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The Alloyed-led project has xx.xx of funding and an April 2025-October 2026 funded period. This independently establishes bounded development activity, not annual material sales or recurring production purchases. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
30. Safran - FY 2025 Results and Investor Update, February 13, 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))

31. Airbus - Full-Year 2025 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 deliveries by aircraft family provide the starting activity comparison for the initial-production forecast; aircraft delivery value is not included in the material numerator. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx% decline in 2025 self-financed R&D is counterevidence to uniform development-budget acceleration and supports a restrained, explicitly assumed development-purchasing scenario. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.

32. Airbus - Half-Year 2026 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 update retained the A320-family, A350 and other production-rate targets, providing a dated commercial constraint on the initial-production activity scenario rather than proof of future material orders. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: First-half 2026 self-financed R&D of EUR xx.xx versus EUR xx.xx provides a modest-growth countercheck for the assumed development-project activity path; the budget is not material-market revenue. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))

33. RTX Corporation - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

34. Federal Reserve Bank of St. Louis - Annual USD/GBP Exchange Rate, AEXUSUK
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
35. L3Harris Technologies, Inc. - Fiscal 2025 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
36. FAA Aerospace Forecast Fiscal Years 2025-2045 - Commercial Space
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated official low/high scenarios provide FY2032 licensed launch/reentry activity bounds. Their U.S.-licensed scope and treatment of reusable vehicles prevent direct conversion into Global material revenue. ([faa.gov](https://www.faa.gov/data_research/aviation/aerospace_forecasts/2025-commercial-space.pdf))
37. ICAO - Convention on International Civil Aviation, Ninth Edition
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))

38. DFARS 252.225-7009 - Restriction on Acquisition of Certain Articles Containing Specialty Metals
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
39. Aubert & Duval - Space Industry Metallurgical Solutions
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
40. Aubert & Duval - Metallurgical Solutions for the Defense Industry, June 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
41. Berkshire Hathaway Inc. - 2025 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.

42. Lufthansa Group Annual Report 2025 - MRO business segment
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
43. Oliver Wyman - Global Fleet And MRO Market Forecast 2026-2036: Key Trends
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
44. German Aerospace Center (DLR) - Financing
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
45. Federal Aviation Administration - Parts Manufacturer Approval (PMA): Design Approval
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.

46. Rolled Alloys - E-Services Stocking Programs
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
47. Boeing BDS Terms and Conditions Guide - D604 Raw Material Risk Mitigation
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
48. Carpenter Technology Corporation - Second Quarter Fiscal 2026 Earnings Call Presentation, January 29, 2026
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation distinguishes specialized non-LTA business from a conventional spot market, countering automatic classification of transactional sales as stock.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Three additional aerospace LTAs and xx.xx% sequential commercial-aerospace bookings growth inform the reservation hypothesis, but do not measure its modeled magnitude.
49. Precision Castparts Corp. - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.

50. Howmet Aerospace - United States Locations
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
51. ATI Inc. - 2024 Annual Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New sales commitments through 2040, including amounts expected during the remainder of the decade and predominantly involving jet-engine nickel alloys, inform the direct-program forecast premise without being counted as realized sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% of fiscal-2024 plate volume went to independent service centers, providing a historical comparison that cautions against assuming generalized intermediary displacement.
52. Alloyed - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.

53. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 aerospace realization and revenue provide the common monetary calibration for this modeled grade; neither is a grade-specific sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace material realization supplies a price-scale input, with modeled year and product-mix adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization calibrates the assumed blended material price, not this grade's observed revenue. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace realization provides a shared monetary comparison for the assumed grade price. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported eight-to-ten-year aerospace application-introduction periods constrain interpretation of the seven-year adoption forecast. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace application-introduction periods provide an adoption-delay counterweight, not a forecast sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
54. European Commission CORDIS - Welding Metallurgy and Cracking in Superalloys: Reporting
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical all-sector tonnage discussion is only a dominance cross-check; it cannot establish current aerospace monetary share. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies 718Plus separately from ordinary xx.xx supporting identity separation without supplying a current sales weight. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
55. Special Metals - Alloy Surcharge Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: August-October 2026 grade surcharges provide a differentiated cost-exposure check, not full invoice prices or observed 2032 prices. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx surcharge sequence independently qualifies a uniform price assumption; it is not substituted for a material selling price. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The grade-specific surcharge listing is a commercial cost comparison, not an observed Global grade realization. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))

56. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current-and-past supplier identity mapping only; not proof of 2025 aerospace sales or the modeled volume. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: CMSX-xx.xx is separately identified; the material-value weight remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current sales are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713C is listed separately from IN-713LC; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713LC is listed separately from IN-713C; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx identity mapping only; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-738LC is separately identified; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current aerospace tonnes are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx appears in a current-and-past identification list; this does not establish recurring aerospace production sales. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: MAR-M xx.xx is identified separately from CM247LC; monetary weights remain modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PWA xx.xx is separately identified; no attributable sales value is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; current commercial scale remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; no current grade-specific material sales are disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Udimet xx.xx appears in the supplier's current-and-past identities; aerospace attribution is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

57. GE Aerospace - Safety First: A Retiring GE Aerospace Materials Engineer Made Protecting Lives His Mission
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
58. Aubert & Duval - AD730: Ni-Based Superalloy for High Temperature Applications
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
59. University of Portsmouth - Improved Creep-Fatigue-Oxidation Resistance in Gas Turbine Disc Materials: REF Impact Case Study
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))

60. Influence of Long Term Exposure in Air on Microstructure, Surface Stability and Mechanical Properties of UDIMET 720LI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The aerospace-industry publication distinguishes conventional Udimet xx.xx from its 720Li derivative; it does not establish a current monetary allocation. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The publication independently supports the 720Li identity and aircraft-engine-disc category, without supplying current sales. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))
61. NASA Contractor Report 174639 - Literature Survey on Oxidations and Fatigue Lives at Elevated Temperatures
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical institutional material identification is a legacy-category anchor only; it does not demonstrate current aerospace material sales. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
62. America Makes - 5566.002 Proliferation of Nickel Superalloy Material Datasets for Powder Bed Fusion Additive Manufacturing
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))
63. GE Aerospace - Fourth Quarter 2025 Earnings Presentation
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 commercial-engine delivery growth supplies a near-term demand cross-check, not a grade-specific purchasing or seven-year growth observation. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aggregate commercial and defense delivery growth constrains the commercial-demand scenario without establishing this grade's attributable consumption. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported defense-engine delivery growth is a demand-exposure check only; the PWA xx.xx activity factor remains assumed. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

18.4. France

Table 436. France Nickel-Based Superalloys for Aerospace Market Size, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
France	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 437. France Nickel-Based Superalloys for Aerospace Market Size, by Product Form, 2017-2040 (USD Million)

Product Form	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Bars, Rods and Profiles	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Billets and Forging Stock	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ingots	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Plate, Sheet, Strip and Foil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Powder	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Tubes and Pipes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Wire	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 438. France Nickel-Based Superalloys for Aerospace Market Size, by Strengthening Class, 2017-2040 (USD Million)

Strengthening Class	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Dispersion-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Precipitation-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Solid-Solution-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 439. France Nickel-Based Superalloys for Aerospace Market Size, by Component Application, 2017-2040 (USD Million)

Component Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Breathing Propulsion & Auxiliary Power	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Systems & Equipment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rocket & Spacecraft Propulsion	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Vehicle Structures & Thermal Protection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 440. France Nickel-Based Superalloys for Aerospace Market Size, by Air-Breathing Propulsion & Auxiliary Power, 2017-2040 (USD Million)

Air-Breathing Propulsion & Auxiliary Power	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combustion & Exhaust Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Compressor Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine Structures & Auxiliary Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Blades & Vanes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Disks & Rotor Hardware	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 441. France Nickel-Based Superalloys for Aerospace Market Size, by Demand Stage, 2017-2040 (USD Million)

Demand Stage	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Initial Equipment Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Repair, Overhaul & Refurbishment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Replacement & Retrofit Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research, Development & Qualification	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 442. France Nickel-Based Superalloys for Aerospace Market Size, by Aerospace End Market, 2017-2040 (USD Million)

Aerospace End Market	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Civil & Nonmilitary State Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Guided Missile Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Military Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Space Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 443. France Nickel-Based Superalloys for Aerospace Market Size, by Buyer Function, 2017-2040 (USD Million)

Buyer Function	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Aerospace Vehicle Manufacturers & Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Component & Subassembly Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine & Propulsion-System Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Maintenance, Repair & Overhaul Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Development Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 444. France Nickel-Based Superalloys for Aerospace Market Size, by Fulfillment Model, 2017-2040 (USD Million)

Fulfillment Model	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Order-Dedicated Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stock Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 445. France Nickel-Based Superalloys for Aerospace Market Size, by Supply Channel, 2017-2040 (USD Million)

Supply Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Captive Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent Intermediary Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Producer-Direct Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 446. France Nickel-Based Superalloys for Aerospace Market Size, by Alloy Grade, 2017-2040 (USD Million)

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ABD-1000AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
ABD-900AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 446 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
AD730	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy 718Plus	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy X-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CM247LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CMSX-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hastelloy X	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713C	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-738LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
MAR-M xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic 80A	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene 88DT	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 446 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
RR1000	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet 720Li	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Waspaloy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. ATI Inc. - 2025 Form 10-K

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC's reported financial/product-category inputs and listed ingot offering constrain the eligible material envelope; the ingot allocation remains assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: AA&S sales of USD xx.xx and its xx.xx% nickel-based/specialty-alloy category anchor the separately adjusted rolled-material envelope.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial jet-engine revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025, supporting purchasing recovery but not identifying price growth or a 2032 material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))

2. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
3. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Narrow-strip supply supports a limited flat-product allocation within the modeled eligible Carpenter envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire is a disclosed supplied form; its eligible monetary weight remains modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.

4. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical xx.xx% slab/bar/billet revenue category constrains the long-stock proxy; its eligible billet split is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported combined stock category provides a proxy anchor, not a separately disclosed bar revenue share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 flat products represented approximately xx.xx% of net product revenue; extrapolation to the eligible Acerinox envelope is modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 wire represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 tubulars represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical product revenue, channel mix and backlog conversion anchor the modeled stock value weight, with explicit scope adjustments.

5. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Casting-alloy activities support an ingot-material equivalent rather than attributing full engine-component revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed metal/billet activities support retaining a forging-stock allocation; the assumed xx.xx% weight is not reported.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported 2025 sales of USD xx.xx and Engine Products aerospace revenues of USD xx.xx commercial and USD xx.xx defense establish the component-cohort scale; USD xx.xx gas-turbine revenue is excluded through an explicit attribution model. These are not material-market revenues. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The segment/end-market revenue table supplies the aerospace and gas-turbine boundaries needed to bridge combined spares activity into an aerospace replacement-material proxy. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial aerospace represented xx.xx% of 2025 company sales, supplying an independent downstream mix comparison rather than a nickel-material allocation weight. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense aerospace represented xx.xx% of 2025 company sales; the paired commercial/defense comparison tests the aviation model while retaining component and material-scope differences. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.

6. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: GE describes repaired/serviceable-part reuse, supporting a counterforce to converting aftermarket activity directly into newly supplied material purchases. Its reported approximately xx.xx% strategic-nickel revert content is not deducted from the terminal-material market. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Commercial repair and component reuse support retaining uncertainty around replacement-related combustion material purchases. The selected procurement-intensity offset remains an assumption, not a measured avoided-purchase percentage. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
7. Special Metals - Tech Center
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised ingot supply establishes a PCC material-form crosswalk, not its sales weight.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised billet supply supports the forging-stock category mapping within the inherited PCC envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised bar supply supports classification only; the monetary coefficient is an assumption.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Plate, sheet and strip offerings support a distinct flat-product allocation premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire availability supports the material-form crosswalk without establishing revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Tubing availability supports the material-form crosswalk without establishing revenue.

8. DPC Holdings Limited - Registration Statement with 2025 Financial Statements
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing separates ingots from component sales and describes external supply and xx.xx% internal superalloy sourcing, contradicting the inherited xx.xx% captive parameter.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
9. Acerinox - Results FY 2025
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned US long-product expansion supports the relative conventional-long-material premise; investment is not recognized as sales.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately USD xx.xx of planned platform investment includes expansion of the long-products offering, informing the bars forecast premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace demand and planned long-product diversification support testing a relative mix shift without assuming flat-product contraction.
10. Haynes International - HAYNES 282
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Powder is offered alongside conventional forms for HAYNES xx.xx supporting nonexclusive form classification, not an observed sales allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))

11. CMA - Anticipated Acquisition of Haynes International by Acerinox: Full Text Decision
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct customer evidence in paragraphs xx.xx-xx.xx supports separate flat/long purchasing pools; no published market-share table is used.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Shape-specific purchasing supports a distinct long-stock allocation model without proving a separate competitive market for billet.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
12. Haynes International - HAYNES 230
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))

13. Carpenter Technology - Advanced Materials for Aerospace Motor & Engines

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation.
([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation.
([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))

14. Elementum 3D - Metal Alloy Additive Manufacturing Colorado

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed.
([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed.
([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))

15. NASA - NASA-Developed Printable Metal Can Take the Heat

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake.
([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake.
([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

16. Carpenter Technology - Lighter, Faster, Stronger Metallurgy for Defense, July 2025

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

17. Special Metals - Aerospace
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy xx.xx; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy X-xx.xx; no current sales quantity is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Waspaloy; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

18. Boeing - BDS Terms and Conditions Guide, D607 Material Substitution Prohibition, November 15, 2013
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: D607 prohibits unauthorized material substitutions while recognizing specified alternatives. It constrains assumptions about frictionless cross-class substitution, without quantifying adoption delays. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization requirements qualify assumptions about precipitation-family substitution opportunities; the clause does not prove future purchases or a class-growth premium. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause prohibits unauthorized substitutions where contractually applicable. It constrains the adoption interpretation but does not establish approval prevalence or a numerical adoption rate. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific material authorization is a counterweight to treating a named offering as immediately substitutable production material. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization limits interpretation of the assumed adoption multiplier; it does not directly establish powder sales. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))

19. Precision Castparts Corp. - Fiscal 2015 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
20. NASA - Chapter 2: Aerospace Materials Characteristics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

21. ESA - ESA Space Environment Report 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
22. NASA and Superalloys: A Customer, a Participant, and a Referee
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
23. VDM Metals - Alloys for the Aerospace Industry
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
24. Carpenter Technology - Business Segments
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))

25. Howmet Aerospace - 2025 Annual Report, Letter to Shareholders

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% combined aerospace and gas-turbine spares revenue constrains the distinction between initial-production and spare-component activity; material and destination adjustments remain modeled. ([howmet.com](https://www.howmet.com/annualreport/))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed combined spares proportion supplies the replacement proxy; approximately xx.xx% commercial aerospace engine-spares growth is historical counterevidence against assuming weak aftermarket activity. ([howmet.com](https://www.howmet.com/annualreport/))

26. GE Aerospace - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment and services costs provide commercial budget anchors for the common material-value denominator; assumed eligible-material fractions prevent full equipment or service value from entering the allocation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Services include spare parts and maintenance activity, supporting an explicit new-article versus restoration attribution rather than equating services revenue with replacement-material purchases. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported USD xx.xx services cost anchors the restoration-material bridge; the restoration allocation and direct eligible-material fraction are assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Total funded R&D of USD xx.xx supplies a development-budget proxy, not observed nickel-material purchasing; only an assumed eligible-material fraction is used. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.

27. Rolls-Royce Holdings Plc - 2025 Full Year Results

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2028 shop-visit target is below the reported 2025 total despite prospective fleet growth, qualifying any automatic conversion of fleet expansion into proportionate maintenance-material purchasing.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The divergence between 2025 engine deliveries and shop visits independently challenges a uniform new-engine-led material forecast; no service revenue is included in the numerator.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Observed engine-delivery and shop-visit activity supports separate new-program and replacement-demand assumptions, not a proportional material-purchase conversion.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

28. UKRI - Accelerating Manufacturing Readiness level of ABD-1000AM for AM of high temperature aerospace components (AMRAM1000)
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The Alloyed-led project has xx.xx of funding and an April 2025-October 2026 funded period. This independently establishes bounded development activity, not annual material sales or recurring production purchases. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
29. Safran - FY 2025 Results and Investor Update, February 13, 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))

30. Airbus - Full-Year 2025 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 deliveries by aircraft family provide the starting activity comparison for the initial-production forecast; aircraft delivery value is not included in the material numerator. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx% decline in 2025 self-financed R&D is counterevidence to uniform development-budget acceleration and supports a restrained, explicitly assumed development-purchasing scenario. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.

31. Airbus - Half-Year 2026 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 update retained the A320-family, A350 and other production-rate targets, providing a dated commercial constraint on the initial-production activity scenario rather than proof of future material orders. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: First-half 2026 self-financed R&D of EUR xx.xx versus EUR xx.xx provides a modest-growth countercheck for the assumed development-project activity path; the budget is not material-market revenue. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))

32. RTX Corporation - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

33. Federal Reserve Bank of St. Louis - Annual USD/GBP Exchange Rate, AEXUSUK
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
34. L3Harris Technologies, Inc. - Fiscal 2025 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
35. FAA Aerospace Forecast Fiscal Years 2025-2045 - Commercial Space
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated official low/high scenarios provide FY2032 licensed launch/reentry activity bounds. Their U.S.-licensed scope and treatment of reusable vehicles prevent direct conversion into Global material revenue. ([faa.gov](https://www.faa.gov/data_research/aviation/aerospace_forecasts/2025-commercial-space.pdf))
36. ICAO - Convention on International Civil Aviation, Ninth Edition
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))

37. DFARS 252.225-7009 - Restriction on Acquisition of Certain Articles Containing Specialty Metals
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
38. Aubert & Duval - Space Industry Metallurgical Solutions
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
39. Aubert & Duval - Metallurgical Solutions for the Defense Industry, June 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
40. Berkshire Hathaway Inc. - 2025 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.

41. Lufthansa Group Annual Report 2025 - MRO business segment
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
42. Oliver Wyman - Global Fleet And MRO Market Forecast 2026-2036: Key Trends
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
43. German Aerospace Center (DLR) - Financing
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
44. Federal Aviation Administration - Parts Manufacturer Approval (PMA): Design Approval
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.

45. Rolled Alloys - E-Services Stocking Programs
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
46. Boeing BDS Terms and Conditions Guide - D604 Raw Material Risk Mitigation
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
47. Carpenter Technology Corporation - Second Quarter Fiscal 2026 Earnings Call Presentation, January 29, 2026
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation distinguishes specialized non-LTA business from a conventional spot market, countering automatic classification of transactional sales as stock.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Three additional aerospace LTAs and xx.xx% sequential commercial-aerospace bookings growth inform the reservation hypothesis, but do not measure its modeled magnitude.
48. Precision Castparts Corp. - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.

49. Howmet Aerospace - United States Locations
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.

50. ATI Inc. - 2024 Annual Report
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New sales commitments through 2040, including amounts expected during the remainder of the decade and predominantly involving jet-engine nickel alloys, inform the direct-program forecast premise without being counted as realized sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% of fiscal-2024 plate volume went to independent service centers, providing a historical comparison that cautions against assuming generalized intermediary displacement.

51. Alloyed - About
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.

52. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 aerospace realization and revenue provide the common monetary calibration for this modeled grade; neither is a grade-specific sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace material realization supplies a price-scale input, with modeled year and product-mix adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization calibrates the assumed blended material price, not this grade's observed revenue. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace realization provides a shared monetary comparison for the assumed grade price. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported eight-to-ten-year aerospace application-introduction periods constrain interpretation of the seven-year adoption forecast. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace application-introduction periods provide an adoption-delay counterweight, not a forecast sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
53. European Commission CORDIS - Welding Metallurgy and Cracking in Superalloys: Reporting
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical all-sector tonnage discussion is only a dominance cross-check; it cannot establish current aerospace monetary share. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies 718Plus separately from ordinary xx.xx supporting identity separation without supplying a current sales weight. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
54. Special Metals - Alloy Surcharge Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: August-October 2026 grade surcharges provide a differentiated cost-exposure check, not full invoice prices or observed 2032 prices. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx surcharge sequence independently qualifies a uniform price assumption; it is not substituted for a material selling price. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The grade-specific surcharge listing is a commercial cost comparison, not an observed Global grade realization. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))

55. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current-and-past supplier identity mapping only; not proof of 2025 aerospace sales or the modeled volume. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: CMSX-xx.xx is separately identified; the material-value weight remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current sales are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713C is listed separately from IN-713LC; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713LC is listed separately from IN-713C; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx identity mapping only; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-738LC is separately identified; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current aerospace tonnes are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx appears in a current-and-past identification list; this does not establish recurring aerospace production sales. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: MAR-M xx.xx is identified separately from CM247LC; monetary weights remain modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PWA xx.xx is separately identified; no attributable sales value is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; current commercial scale remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; no current grade-specific material sales are disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Udimet xx.xx appears in the supplier's current-and-past identities; aerospace attribution is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

56. GE Aerospace - Safety First: A Retiring GE Aerospace Materials Engineer Made Protecting Lives His Mission
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
57. Aubert & Duval - AD730: Ni-Based Superalloy for High Temperature Applications
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
58. University of Portsmouth - Improved Creep-Fatigue-Oxidation Resistance in Gas Turbine Disc Materials: REF Impact Case Study
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))

59. Influence of Long Term Exposure in Air on Microstructure, Surface Stability and Mechanical Properties of UDIMET 720LI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The aerospace-industry publication distinguishes conventional Udimet xx.xx from its 720Li derivative; it does not establish a current monetary allocation. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The publication independently supports the 720Li identity and aircraft-engine-disc category, without supplying current sales. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

60. NASA Contractor Report 174639 - Literature Survey on Oxidations and Fatigue Lives at Elevated Temperatures

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical institutional material identification is a legacy-category anchor only; it does not demonstrate current aerospace material sales. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

61. America Makes - 5566.002 Proliferation of Nickel Superalloy Material Datasets for Powder Bed Fusion Additive Manufacturing

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))

62. GE Aerospace - Fourth Quarter 2025 Earnings Presentation

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 commercial-engine delivery growth supplies a near-term demand cross-check, not a grade-specific purchasing or seven-year growth observation. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aggregate commercial and defense delivery growth constrains the commercial-demand scenario without establishing this grade's attributable consumption. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported defense-engine delivery growth is a demand-exposure check only; the PWA xx.xx activity factor remains assumed. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

18.5. Germany

Table 447. Germany Nickel-Based Superalloys for Aerospace Market Size, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Germany	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 448. Germany Nickel-Based Superalloys for Aerospace Market Size, by Product Form, 2017-2040 (USD Million)

Product Form	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Bars, Rods and Profiles	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Billets and Forging Stock	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ingots	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Plate, Sheet, Strip and Foil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Powder	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Tubes and Pipes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Wire	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 449. Germany Nickel-Based Superalloys for Aerospace Market Size, by Strengthening Class, 2017-2040 (USD Million)

Strengthening Class	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Dispersion-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Precipitation-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Solid-Solution-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 450. Germany Nickel-Based Superalloys for Aerospace Market Size, by Component Application, 2017-2040 (USD Million)

Component Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Breathing Propulsion & Auxiliary Power	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Systems & Equipment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rocket & Spacecraft Propulsion	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Vehicle Structures & Thermal Protection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 451. Germany Nickel-Based Superalloys for Aerospace Market Size, by Air-Breathing Propulsion & Auxiliary Power, 2017-2040 (USD Million)

Air-Breathing Propulsion & Auxiliary Power	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combustion & Exhaust Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Compressor Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine Structures & Auxiliary Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Blades & Vanes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Disks & Rotor Hardware	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 452. Germany Nickel-Based Superalloys for Aerospace Market Size, by Demand Stage, 2017-2040 (USD Million)

Demand Stage	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Initial Equipment Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Repair, Overhaul & Refurbishment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Replacement & Retrofit Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research, Development & Qualification	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 453. Germany Nickel-Based Superalloys for Aerospace Market Size, by Aerospace End Market, 2017-2040 (USD Million)

Aerospace End Market	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Civil & Nonmilitary State Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Guided Missile Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Military Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Space Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 454. Germany Nickel-Based Superalloys for Aerospace Market Size, by Buyer Function, 2017-2040 (USD Million)

Buyer Function	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Aerospace Vehicle Manufacturers & Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Component & Subassembly Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine & Propulsion-System Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Maintenance, Repair & Overhaul Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Development Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 455. Germany Nickel-Based Superalloys for Aerospace Market Size, by Fulfillment Model, 2017-2040 (USD Million)

Fulfillment Model	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Order-Dedicated Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stock Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 456. Germany Nickel-Based Superalloys for Aerospace Market Size, by Supply Channel, 2017-2040 (USD Million)

Supply Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Captive Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent Intermediary Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Producer-Direct Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 457. Germany Nickel-Based Superalloys for Aerospace Market Size, by Alloy Grade, 2017-2040 (USD Million)

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ABD-1000AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
ABD-900AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 457 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
AD730	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy 718Plus	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy X-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CM247LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CMSX-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hastelloy X	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713C	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-738LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
MAR-M xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic 80A	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene 88DT	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 457 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
RR1000	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet 720Li	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Waspaloy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. ATI Inc. - 2025 Form 10-K

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC's reported financial/product-category inputs and listed ingot offering constrain the eligible material envelope; the ingot allocation remains assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: AA&S sales of USD xx.xx and its xx.xx% nickel-based/specialty-alloy category anchor the separately adjusted rolled-material envelope.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial jet-engine revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025, supporting purchasing recovery but not identifying price growth or a 2032 material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))

2. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
3. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Narrow-strip supply supports a limited flat-product allocation within the modeled eligible Carpenter envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire is a disclosed supplied form; its eligible monetary weight remains modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.

4. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical xx.xx% slab/bar/billet revenue category constrains the long-stock proxy; its eligible billet split is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported combined stock category provides a proxy anchor, not a separately disclosed bar revenue share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 flat products represented approximately xx.xx% of net product revenue; extrapolation to the eligible Acerinox envelope is modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 wire represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 tubulars represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical product revenue, channel mix and backlog conversion anchor the modeled stock value weight, with explicit scope adjustments.

5. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Casting-alloy activities support an ingot-material equivalent rather than attributing full engine-component revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed metal/billet activities support retaining a forging-stock allocation; the assumed xx.xx% weight is not reported.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported 2025 sales of USD xx.xx and Engine Products aerospace revenues of USD xx.xx commercial and USD xx.xx defense establish the component-cohort scale; USD xx.xx gas-turbine revenue is excluded through an explicit attribution model. These are not material-market revenues. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The segment/end-market revenue table supplies the aerospace and gas-turbine boundaries needed to bridge combined spares activity into an aerospace replacement-material proxy. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial aerospace represented xx.xx% of 2025 company sales, supplying an independent downstream mix comparison rather than a nickel-material allocation weight. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense aerospace represented xx.xx% of 2025 company sales; the paired commercial/defense comparison tests the aviation model while retaining component and material-scope differences. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.

6. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: GE describes repaired/serviceable-part reuse, supporting a counterforce to converting aftermarket activity directly into newly supplied material purchases. Its reported approximately xx.xx% strategic-nickel revert content is not deducted from the terminal-material market. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Commercial repair and component reuse support retaining uncertainty around replacement-related combustion material purchases. The selected procurement-intensity offset remains an assumption, not a measured avoided-purchase percentage. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
7. Special Metals - Tech Center
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised ingot supply establishes a PCC material-form crosswalk, not its sales weight.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised billet supply supports the forging-stock category mapping within the inherited PCC envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised bar supply supports classification only; the monetary coefficient is an assumption.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Plate, sheet and strip offerings support a distinct flat-product allocation premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire availability supports the material-form crosswalk without establishing revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Tubing availability supports the material-form crosswalk without establishing revenue.

8. DPC Holdings Limited - Registration Statement with 2025 Financial Statements
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing separates ingots from component sales and describes external supply and xx.xx% internal superalloy sourcing, contradicting the inherited xx.xx% captive parameter.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
9. Acerinox - Results FY 2025
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned US long-product expansion supports the relative conventional-long-material premise; investment is not recognized as sales.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately USD xx.xx of planned platform investment includes expansion of the long-products offering, informing the bars forecast premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace demand and planned long-product diversification support testing a relative mix shift without assuming flat-product contraction.
10. Haynes International - HAYNES 282
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Powder is offered alongside conventional forms for HAYNES xx.xx supporting nonexclusive form classification, not an observed sales allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))

11. CMA - Anticipated Acquisition of Haynes International by Acerinox: Full Text Decision
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct customer evidence in paragraphs xx.xx-xx.xx supports separate flat/long purchasing pools; no published market-share table is used.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Shape-specific purchasing supports a distinct long-stock allocation model without proving a separate competitive market for billet.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
12. Haynes International - HAYNES 230
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))

13. Carpenter Technology - Advanced Materials for Aerospace Motor & Engines

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation.
([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation.
([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))

14. Elementum 3D - Metal Alloy Additive Manufacturing Colorado

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed.
([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed.
([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))

15. NASA - NASA-Developed Printable Metal Can Take the Heat

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake.
([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake.
([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

16. Carpenter Technology - Lighter, Faster, Stronger Metallurgy for Defense, July 2025

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

17. Special Metals - Aerospace
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy xx.xx; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy X-xx.xx; no current sales quantity is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Waspaloy; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

18. Boeing - BDS Terms and Conditions Guide, D607 Material Substitution Prohibition, November 15, 2013
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: D607 prohibits unauthorized material substitutions while recognizing specified alternatives. It constrains assumptions about frictionless cross-class substitution, without quantifying adoption delays. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization requirements qualify assumptions about precipitation-family substitution opportunities; the clause does not prove future purchases or a class-growth premium. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause prohibits unauthorized substitutions where contractually applicable. It constrains the adoption interpretation but does not establish approval prevalence or a numerical adoption rate. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific material authorization is a counterweight to treating a named offering as immediately substitutable production material. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization limits interpretation of the assumed adoption multiplier; it does not directly establish powder sales. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))

19. Precision Castparts Corp. - Fiscal 2015 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
20. NASA - Chapter 2: Aerospace Materials Characteristics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

21. ESA - ESA Space Environment Report 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
22. NASA and Superalloys: A Customer, a Participant, and a Referee
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
23. VDM Metals - Alloys for the Aerospace Industry
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
24. Carpenter Technology - Business Segments
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))

25. Howmet Aerospace - 2025 Annual Report, Letter to Shareholders

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% combined aerospace and gas-turbine spares revenue constrains the distinction between initial-production and spare-component activity; material and destination adjustments remain modeled. ([howmet.com](https://www.howmet.com/annualreport/))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed combined spares proportion supplies the replacement proxy; approximately xx.xx% commercial aerospace engine-spares growth is historical counterevidence against assuming weak aftermarket activity. ([howmet.com](https://www.howmet.com/annualreport/))

26. GE Aerospace - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment and services costs provide commercial budget anchors for the common material-value denominator; assumed eligible-material fractions prevent full equipment or service value from entering the allocation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Services include spare parts and maintenance activity, supporting an explicit new-article versus restoration attribution rather than equating services revenue with replacement-material purchases. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported USD xx.xx services cost anchors the restoration-material bridge; the restoration allocation and direct eligible-material fraction are assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Total funded R&D of USD xx.xx supplies a development-budget proxy, not observed nickel-material purchasing; only an assumed eligible-material fraction is used. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.

27. Rolls-Royce Holdings Plc - 2025 Full Year Results

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2028 shop-visit target is below the reported 2025 total despite prospective fleet growth, qualifying any automatic conversion of fleet expansion into proportionate maintenance-material purchasing.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The divergence between 2025 engine deliveries and shop visits independently challenges a uniform new-engine-led material forecast; no service revenue is included in the numerator.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Observed engine-delivery and shop-visit activity supports separate new-program and replacement-demand assumptions, not a proportional material-purchase conversion.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

28. UKRI - Accelerating Manufacturing Readiness level of ABD-1000AM for AM of high temperature aerospace components (AMRAM1000)
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The Alloyed-led project has xx.xx of funding and an April 2025-October 2026 funded period. This independently establishes bounded development activity, not annual material sales or recurring production purchases. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
29. Safran - FY 2025 Results and Investor Update, February 13, 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))

30. Airbus - Full-Year 2025 Results

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 deliveries by aircraft family provide the starting activity comparison for the initial-production forecast; aircraft delivery value is not included in the material numerator. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx% decline in 2025 self-financed R&D is counterevidence to uniform development-budget acceleration and supports a restrained, explicitly assumed development-purchasing scenario. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.

31. Airbus - Half-Year 2026 Results

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 update retained the A320-family, A350 and other production-rate targets, providing a dated commercial constraint on the initial-production activity scenario rather than proof of future material orders. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: First-half 2026 self-financed R&D of EUR xx.xx versus EUR xx.xx provides a modest-growth countercheck for the assumed development-project activity path; the budget is not material-market revenue. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))

32. RTX Corporation - 2025 Form 10-K

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

33. Federal Reserve Bank of St. Louis - Annual USD/GBP Exchange Rate, AEXUSUK
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
34. L3Harris Technologies, Inc. - Fiscal 2025 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
35. FAA Aerospace Forecast Fiscal Years 2025-2045 - Commercial Space
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated official low/high scenarios provide FY2032 licensed launch/reentry activity bounds. Their U.S.-licensed scope and treatment of reusable vehicles prevent direct conversion into Global material revenue. ([faa.gov](https://www.faa.gov/data_research/aviation/aerospace_forecasts/2025-commercial-space.pdf))
36. ICAO - Convention on International Civil Aviation, Ninth Edition
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))

37. DFARS 252.225-7009 - Restriction on Acquisition of Certain Articles Containing Specialty Metals
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
38. Aubert & Duval - Space Industry Metallurgical Solutions
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
39. Aubert & Duval - Metallurgical Solutions for the Defense Industry, June 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
40. Berkshire Hathaway Inc. - 2025 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.

41. Lufthansa Group Annual Report 2025 - MRO business segment
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
42. Oliver Wyman - Global Fleet And MRO Market Forecast 2026-2036: Key Trends
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
43. German Aerospace Center (DLR) - Financing
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
44. Federal Aviation Administration - Parts Manufacturer Approval (PMA): Design Approval
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.

45. Rolled Alloys - E-Services Stocking Programs
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
46. Boeing BDS Terms and Conditions Guide - D604 Raw Material Risk Mitigation
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
47. Carpenter Technology Corporation - Second Quarter Fiscal 2026 Earnings Call Presentation, January 29, 2026
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation distinguishes specialized non-LTA business from a conventional spot market, countering automatic classification of transactional sales as stock.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Three additional aerospace LTAs and xx.xx% sequential commercial-aerospace bookings growth inform the reservation hypothesis, but do not measure its modeled magnitude.
48. Precision Castparts Corp. - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.

49. Howmet Aerospace - United States Locations
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.

50. ATI Inc. - 2024 Annual Report
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New sales commitments through 2040, including amounts expected during the remainder of the decade and predominantly involving jet-engine nickel alloys, inform the direct-program forecast premise without being counted as realized sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% of fiscal-2024 plate volume went to independent service centers, providing a historical comparison that cautions against assuming generalized intermediary displacement.

51. Alloyed - About
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.

52. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 aerospace realization and revenue provide the common monetary calibration for this modeled grade; neither is a grade-specific sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace material realization supplies a price-scale input, with modeled year and product-mix adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization calibrates the assumed blended material price, not this grade's observed revenue. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace realization provides a shared monetary comparison for the assumed grade price. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported eight-to-ten-year aerospace application-introduction periods constrain interpretation of the seven-year adoption forecast. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace application-introduction periods provide an adoption-delay counterweight, not a forecast sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
53. European Commission CORDIS - Welding Metallurgy and Cracking in Superalloys: Reporting
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical all-sector tonnage discussion is only a dominance cross-check; it cannot establish current aerospace monetary share. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies 718Plus separately from ordinary xx.xx supporting identity separation without supplying a current sales weight. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
54. Special Metals - Alloy Surcharge Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: August-October 2026 grade surcharges provide a differentiated cost-exposure check, not full invoice prices or observed 2032 prices. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx surcharge sequence independently qualifies a uniform price assumption; it is not substituted for a material selling price. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The grade-specific surcharge listing is a commercial cost comparison, not an observed Global grade realization. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))

55. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current-and-past supplier identity mapping only; not proof of 2025 aerospace sales or the modeled volume. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: CMSX-xx.xx is separately identified; the material-value weight remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current sales are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713C is listed separately from IN-713LC; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713LC is listed separately from IN-713C; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx identity mapping only; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-738LC is separately identified; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current aerospace tonnes are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx appears in a current-and-past identification list; this does not establish recurring aerospace production sales. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: MAR-M xx.xx is identified separately from CM247LC; monetary weights remain modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PWA xx.xx is separately identified; no attributable sales value is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; current commercial scale remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; no current grade-specific material sales are disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Udimet xx.xx appears in the supplier's current-and-past identities; aerospace attribution is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

56. GE Aerospace - Safety First: A Retiring GE Aerospace Materials Engineer Made Protecting Lives His Mission
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
57. Aubert & Duval - AD730: Ni-Based Superalloy for High Temperature Applications
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
58. University of Portsmouth - Improved Creep-Fatigue-Oxidation Resistance in Gas Turbine Disc Materials: REF Impact Case Study
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))

59. Influence of Long Term Exposure in Air on Microstructure, Surface Stability and Mechanical Properties of UDIMET 720LI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The aerospace-industry publication distinguishes conventional Udimet xx.xx from its 720Li derivative; it does not establish a current monetary allocation. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The publication independently supports the 720Li identity and aircraft-engine-disc category, without supplying current sales. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

60. NASA Contractor Report 174639 - Literature Survey on Oxidations and Fatigue Lives at Elevated Temperatures

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical institutional material identification is a legacy-category anchor only; it does not demonstrate current aerospace material sales. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

61. America Makes - 5566.002 Proliferation of Nickel Superalloy Material Datasets for Powder Bed Fusion Additive Manufacturing

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))

62. GE Aerospace - Fourth Quarter 2025 Earnings Presentation

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 commercial-engine delivery growth supplies a near-term demand cross-check, not a grade-specific purchasing or seven-year growth observation. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aggregate commercial and defense delivery growth constrains the commercial-demand scenario without establishing this grade's attributable consumption. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported defense-engine delivery growth is a demand-exposure check only; the PWA xx.xx activity factor remains assumed. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

18.6. Mexico

Table 458. Mexico Nickel-Based Superalloys for Aerospace Market Size, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Mexico	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 459. Mexico Nickel-Based Superalloys for Aerospace Market Size, by Product Form, 2017-2040 (USD Million)

Product Form	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Bars, Rods and Profiles	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Billets and Forging Stock	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ingots	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Plate, Sheet, Strip and Foil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Powder	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Tubes and Pipes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Wire	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 460. Mexico Nickel-Based Superalloys for Aerospace Market Size, by Strengthening Class, 2017-2040 (USD Million)

Strengthening Class	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Dispersion-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Precipitation-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Solid-Solution-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 461. Mexico Nickel-Based Superalloys for Aerospace Market Size, by Component Application, 2017-2040 (USD Million)

Component Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Breathing Propulsion & Auxiliary Power	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Systems & Equipment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rocket & Spacecraft Propulsion	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Vehicle Structures & Thermal Protection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 462. Mexico Nickel-Based Superalloys for Aerospace Market Size, by Air-Breathing Propulsion & Auxiliary Power, 2017-2040 (USD Million)

Air-Breathing Propulsion & Auxiliary Power	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combustion & Exhaust Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Compressor Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine Structures & Auxiliary Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Blades & Vanes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Disks & Rotor Hardware	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 463. Mexico Nickel-Based Superalloys for Aerospace Market Size, by Demand Stage, 2017-2040 (USD Million)

Demand Stage	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Initial Equipment Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Repair, Overhaul & Refurbishment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Replacement & Retrofit Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research, Development & Qualification	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 464. Mexico Nickel-Based Superalloys for Aerospace Market Size, by Aerospace End Market, 2017-2040 (USD Million)

Aerospace End Market	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Civil & Nonmilitary State Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Guided Missile Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Military Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Space Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 465. Mexico Nickel-Based Superalloys for Aerospace Market Size, by Buyer Function, 2017-2040 (USD Million)

Buyer Function	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Aerospace Vehicle Manufacturers & Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Component & Subassembly Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine & Propulsion-System Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Maintenance, Repair & Overhaul Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Development Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 466. Mexico Nickel-Based Superalloys for Aerospace Market Size, by Fulfillment Model, 2017-2040 (USD Million)

Fulfillment Model	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Order-Dedicated Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stock Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 467. Mexico Nickel-Based Superalloys for Aerospace Market Size, by Supply Channel, 2017-2040 (USD Million)

Supply Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Captive Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent Intermediary Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Producer-Direct Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 468. Mexico Nickel-Based Superalloys for Aerospace Market Size, by Alloy Grade, 2017-2040 (USD Million)

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ABD-1000AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
ABD-900AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 468 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
AD730	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy 718Plus	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy X-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CM247LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CMSX-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hastelloy X	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713C	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-738LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
MAR-M xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic 80A	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene 88DT	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 468 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
RR1000	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet 720Li	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Waspaloy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. ATI Inc. - 2025 Form 10-K

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC's reported financial/product-category inputs and listed ingot offering constrain the eligible material envelope; the ingot allocation remains assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: AA&S sales of USD xx.xx and its xx.xx% nickel-based/specialty-alloy category anchor the separately adjusted rolled-material envelope.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial jet-engine revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025, supporting purchasing recovery but not identifying price growth or a 2032 material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))

2. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
3. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Narrow-strip supply supports a limited flat-product allocation within the modeled eligible Carpenter envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire is a disclosed supplied form; its eligible monetary weight remains modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.

4. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical xx.xx% slab/bar/billet revenue category constrains the long-stock proxy; its eligible billet split is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported combined stock category provides a proxy anchor, not a separately disclosed bar revenue share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 flat products represented approximately xx.xx% of net product revenue; extrapolation to the eligible Acerinox envelope is modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 wire represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 tubulars represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical product revenue, channel mix and backlog conversion anchor the modeled stock value weight, with explicit scope adjustments.

5. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Casting-alloy activities support an ingot-material equivalent rather than attributing full engine-component revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed metal/billet activities support retaining a forging-stock allocation; the assumed xx.xx% weight is not reported.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported 2025 sales of USD xx.xx and Engine Products aerospace revenues of USD xx.xx commercial and USD xx.xx defense establish the component-cohort scale; USD xx.xx gas-turbine revenue is excluded through an explicit attribution model. These are not material-market revenues. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The segment/end-market revenue table supplies the aerospace and gas-turbine boundaries needed to bridge combined spares activity into an aerospace replacement-material proxy. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial aerospace represented xx.xx% of 2025 company sales, supplying an independent downstream mix comparison rather than a nickel-material allocation weight. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense aerospace represented xx.xx% of 2025 company sales; the paired commercial/defense comparison tests the aviation model while retaining component and material-scope differences. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.

6. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: GE describes repaired/serviceable-part reuse, supporting a counterforce to converting aftermarket activity directly into newly supplied material purchases. Its reported approximately xx.xx% strategic-nickel revert content is not deducted from the terminal-material market. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Commercial repair and component reuse support retaining uncertainty around replacement-related combustion material purchases. The selected procurement-intensity offset remains an assumption, not a measured avoided-purchase percentage. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
7. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexican customer revenue constrains the conditional allocation calibration.
8. Special Metals - Tech Center
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised ingot supply establishes a PCC material-form crosswalk, not its sales weight.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised billet supply supports the forging-stock category mapping within the inherited PCC envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised bar supply supports classification only; the monetary coefficient is an assumption.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Plate, sheet and strip offerings support a distinct flat-product allocation premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire availability supports the material-form crosswalk without establishing revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Tubing availability supports the material-form crosswalk without establishing revenue.

9. DPC Holdings Limited - Registration Statement with 2025 Financial Statements
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing separates ingots from component sales and describes external supply and xx.xx% internal superalloy sourcing, contradicting the inherited xx.xx% captive parameter.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
10. Acerinox - Results FY 2025
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned US long-product expansion supports the relative conventional-long-material premise; investment is not recognized as sales.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately USD xx.xx of planned platform investment includes expansion of the long-products offering, informing the bars forecast premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace demand and planned long-product diversification support testing a relative mix shift without assuming flat-product contraction.
11. Haynes International - HAYNES 282
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Powder is offered alongside conventional forms for HAYNES xx.xx supporting nonexclusive form classification, not an observed sales allocation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))

12. CMA - Anticipated Acquisition of Haynes International by Acerinox: Full Text Decision
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct customer evidence in paragraphs xx.xx-xx.xx supports separate flat/long purchasing pools; no published market-share table is used.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Shape-specific purchasing supports a distinct long-stock allocation model without proving a separate competitive market for billet.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
13. Haynes International - HAYNES 230
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))

14. Carpenter Technology - Advanced Materials for Aerospace Motor & Engines

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation.
([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation.
([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))

15. Elementum 3D - Metal Alloy Additive Manufacturing Colorado

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed.
([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed.
([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))

16. NASA - NASA-Developed Printable Metal Can Take the Heat

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake.
([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake.
([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

17. Carpenter Technology - Lighter, Faster, Stronger Metallurgy for Defense, July 2025

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

18. Special Metals - Aerospace
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy xx.xx; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy X-xx.xx; no current sales quantity is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Waspaloy; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

19. Boeing - BDS Terms and Conditions Guide, D607 Material Substitution Prohibition, November 15, 2013
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: D607 prohibits unauthorized material substitutions while recognizing specified alternatives. It constrains assumptions about frictionless cross-class substitution, without quantifying adoption delays. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization requirements qualify assumptions about precipitation-family substitution opportunities; the clause does not prove future purchases or a class-growth premium. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause prohibits unauthorized substitutions where contractually applicable. It constrains the adoption interpretation but does not establish approval prevalence or a numerical adoption rate. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific material authorization is a counterweight to treating a named offering as immediately substitutable production material. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization limits interpretation of the assumed adoption multiplier; it does not directly establish powder sales. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))

20. Precision Castparts Corp. - Fiscal 2015 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
21. NASA - Chapter 2: Aerospace Materials Characteristics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

22. ESA - ESA Space Environment Report 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
23. NASA and Superalloys: A Customer, a Participant, and a Referee
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
24. VDM Metals - Alloys for the Aerospace Industry
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
25. Carpenter Technology - Business Segments
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))

26. Howmet Aerospace - 2025 Annual Report, Letter to Shareholders

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% combined aerospace and gas-turbine spares revenue constrains the distinction between initial-production and spare-component activity; material and destination adjustments remain modeled. ([howmet.com](https://www.howmet.com/annualreport/))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed combined spares proportion supplies the replacement proxy; approximately xx.xx% commercial aerospace engine-spares growth is historical counterevidence against assuming weak aftermarket activity. ([howmet.com](https://www.howmet.com/annualreport/))

27. GE Aerospace - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment and services costs provide commercial budget anchors for the common material-value denominator; assumed eligible-material fractions prevent full equipment or service value from entering the allocation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Services include spare parts and maintenance activity, supporting an explicit new-article versus restoration attribution rather than equating services revenue with replacement-material purchases. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported USD xx.xx services cost anchors the restoration-material bridge; the restoration allocation and direct eligible-material fraction are assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Total funded R&D of USD xx.xx supplies a development-budget proxy, not observed nickel-material purchasing; only an assumed eligible-material fraction is used. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.

28. Rolls-Royce Holdings Plc - 2025 Full Year Results

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2028 shop-visit target is below the reported 2025 total despite prospective fleet growth, qualifying any automatic conversion of fleet expansion into proportionate maintenance-material purchasing.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The divergence between 2025 engine deliveries and shop visits independently challenges a uniform new-engine-led material forecast; no service revenue is included in the numerator.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Observed engine-delivery and shop-visit activity supports separate new-program and replacement-demand assumptions, not a proportional material-purchase conversion.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

29. UKRI - Accelerating Manufacturing Readiness level of ABD-1000AM for AM of high temperature aerospace components (AMRAM1000)
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The Alloyed-led project has xx.xx of funding and an April 2025-October 2026 funded period. This independently establishes bounded development activity, not annual material sales or recurring production purchases. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
30. Safran - FY 2025 Results and Investor Update, February 13, 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))

31. Airbus - Full-Year 2025 Results

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 deliveries by aircraft family provide the starting activity comparison for the initial-production forecast; aircraft delivery value is not included in the material numerator. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx% decline in 2025 self-financed R&D is counterevidence to uniform development-budget acceleration and supports a restrained, explicitly assumed development-purchasing scenario. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.

32. Airbus - Half-Year 2026 Results

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 update retained the A320-family, A350 and other production-rate targets, providing a dated commercial constraint on the initial-production activity scenario rather than proof of future material orders. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: First-half 2026 self-financed R&D of EUR xx.xx versus EUR xx.xx provides a modest-growth countercheck for the assumed development-project activity path; the budget is not material-market revenue. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))

33. RTX Corporation - 2025 Form 10-K

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

34. Federal Reserve Bank of St. Louis - Annual USD/GBP Exchange Rate, AEXUSUK
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
35. L3Harris Technologies, Inc. - Fiscal 2025 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
36. FAA Aerospace Forecast Fiscal Years 2025-2045 - Commercial Space
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated official low/high scenarios provide FY2032 licensed launch/reentry activity bounds. Their U.S.-licensed scope and treatment of reusable vehicles prevent direct conversion into Global material revenue. ([faa.gov](https://www.faa.gov/data_research/aviation/aerospace_forecasts/2025-commercial-space.pdf))
37. ICAO - Convention on International Civil Aviation, Ninth Edition
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))

38. DFARS 252.225-7009 - Restriction on Acquisition of Certain Articles Containing Specialty Metals

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))

39. Aubert & Duval - Space Industry Metallurgical Solutions

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))

40. Aubert & Duval - Metallurgical Solutions for the Defense Industry, June 2024

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))

41. Berkshire Hathaway Inc. - 2025 Annual Report

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.

42. Lufthansa Group Annual Report 2025 - MRO business segment
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
43. Oliver Wyman - Global Fleet And MRO Market Forecast 2026-2036: Key Trends
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
44. German Aerospace Center (DLR) - Financing
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
45. Federal Aviation Administration - Parts Manufacturer Approval (PMA): Design Approval
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.

46. Rolled Alloys - E-Services Stocking Programs
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
47. Boeing BDS Terms and Conditions Guide - D604 Raw Material Risk Mitigation
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
48. Carpenter Technology Corporation - Second Quarter Fiscal 2026 Earnings Call Presentation, January 29, 2026
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation distinguishes specialized non-LTA business from a conventional spot market, countering automatic classification of transactional sales as stock.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Three additional aerospace LTAs and xx.xx% sequential commercial-aerospace bookings growth inform the reservation hypothesis, but do not measure its modeled magnitude.
49. Precision Castparts Corp. - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.

50. Howmet Aerospace - United States Locations
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
51. ATI Inc. - 2024 Annual Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New sales commitments through 2040, including amounts expected during the remainder of the decade and predominantly involving jet-engine nickel alloys, inform the direct-program forecast premise without being counted as realized sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% of fiscal-2024 plate volume went to independent service centers, providing a historical comparison that cautions against assuming generalized intermediary displacement.
52. Alloyed - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.

53. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 aerospace realization and revenue provide the common monetary calibration for this modeled grade; neither is a grade-specific sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace material realization supplies a price-scale input, with modeled year and product-mix adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization calibrates the assumed blended material price, not this grade's observed revenue. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace realization provides a shared monetary comparison for the assumed grade price. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported eight-to-ten-year aerospace application-introduction periods constrain interpretation of the seven-year adoption forecast. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace application-introduction periods provide an adoption-delay counterweight, not a forecast sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
54. European Commission CORDIS - Welding Metallurgy and Cracking in Superalloys: Reporting
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical all-sector tonnage discussion is only a dominance cross-check; it cannot establish current aerospace monetary share. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies 718Plus separately from ordinary xx.xx supporting identity separation without supplying a current sales weight. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
55. Special Metals - Alloy Surcharge Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: August-October 2026 grade surcharges provide a differentiated cost-exposure check, not full invoice prices or observed 2032 prices. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx surcharge sequence independently qualifies a uniform price assumption; it is not substituted for a material selling price. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The grade-specific surcharge listing is a commercial cost comparison, not an observed Global grade realization. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))

56. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current-and-past supplier identity mapping only; not proof of 2025 aerospace sales or the modeled volume. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: CMSX-xx.xx is separately identified; the material-value weight remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current sales are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713C is listed separately from IN-713LC; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713LC is listed separately from IN-713C; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx identity mapping only; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-738LC is separately identified; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current aerospace tonnes are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx appears in a current-and-past identification list; this does not establish recurring aerospace production sales. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: MAR-M xx.xx is identified separately from CM247LC; monetary weights remain modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PWA xx.xx is separately identified; no attributable sales value is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; current commercial scale remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; no current grade-specific material sales are disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Udimet xx.xx appears in the supplier's current-and-past identities; aerospace attribution is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

57. GE Aerospace - Safety First: A Retiring GE Aerospace Materials Engineer Made Protecting Lives His Mission
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
58. Aubert & Duval - AD730: Ni-Based Superalloy for High Temperature Applications
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
59. University of Portsmouth - Improved Creep-Fatigue-Oxidation Resistance in Gas Turbine Disc Materials: REF Impact Case Study
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))

60. Influence of Long Term Exposure in Air on Microstructure, Surface Stability and Mechanical Properties of UDIMET 720LI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The aerospace-industry publication distinguishes conventional Udimet xx.xx from its 720Li derivative; it does not establish a current monetary allocation. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The publication independently supports the 720Li identity and aircraft-engine-disc category, without supplying current sales. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))
61. NASA Contractor Report 174639 - Literature Survey on Oxidations and Fatigue Lives at Elevated Temperatures
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical institutional material identification is a legacy-category anchor only; it does not demonstrate current aerospace material sales. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
62. America Makes - 5566.002 Proliferation of Nickel Superalloy Material Datasets for Powder Bed Fusion Additive Manufacturing
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))
63. GE Aerospace - Fourth Quarter 2025 Earnings Presentation
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 commercial-engine delivery growth supplies a near-term demand cross-check, not a grade-specific purchasing or seven-year growth observation. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aggregate commercial and defense delivery growth constrains the commercial-demand scenario without establishing this grade's attributable consumption. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported defense-engine delivery growth is a demand-exposure check only; the PWA xx.xx activity factor remains assumed. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

18.7. Japan

Table 469. Japan Nickel-Based Superalloys for Aerospace Market Size, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Japan	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 470. Japan Nickel-Based Superalloys for Aerospace Market Size, by Product Form, 2017-2040 (USD Million)

Product Form	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Bars, Rods and Profiles	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Billets and Forging Stock	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ingots	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Plate, Sheet, Strip and Foil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Powder	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Tubes and Pipes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Wire	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 471. Japan Nickel-Based Superalloys for Aerospace Market Size, by Strengthening Class, 2017-2040 (USD Million)

Strengthening Class	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Dispersion-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Precipitation-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Solid-Solution-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 472. Japan Nickel-Based Superalloys for Aerospace Market Size, by Component Application, 2017-2040 (USD Million)

Component Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Breathing Propulsion & Auxiliary Power	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Systems & Equipment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rocket & Spacecraft Propulsion	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Vehicle Structures & Thermal Protection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 473. Japan Nickel-Based Superalloys for Aerospace Market Size, by Air-Breathing Propulsion & Auxiliary Power, 2017-2040 (USD Million)

Air-Breathing Propulsion & Auxiliary Power	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combustion & Exhaust Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Compressor Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine Structures & Auxiliary Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Blades & Vanes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Disks & Rotor Hardware	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 474. Japan Nickel-Based Superalloys for Aerospace Market Size, by Demand Stage, 2017-2040 (USD Million)

Demand Stage	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Initial Equipment Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Repair, Overhaul & Refurbishment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Replacement & Retrofit Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research, Development & Qualification	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 475. Japan Nickel-Based Superalloys for Aerospace Market Size, by Aerospace End Market, 2017-2040 (USD Million)

Aerospace End Market	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Civil & Nonmilitary State Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Guided Missile Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Military Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Space Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 476. Japan Nickel-Based Superalloys for Aerospace Market Size, by Buyer Function, 2017-2040 (USD Million)

Buyer Function	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Aerospace Vehicle Manufacturers & Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Component & Subassembly Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine & Propulsion-System Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Maintenance, Repair & Overhaul Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Development Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 477. Japan Nickel-Based Superalloys for Aerospace Market Size, by Fulfillment Model, 2017-2040 (USD Million)

Fulfillment Model	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Order-Dedicated Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stock Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 478. Japan Nickel-Based Superalloys for Aerospace Market Size, by Supply Channel, 2017-2040 (USD Million)

Supply Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Captive Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent Intermediary Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Producer-Direct Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 479. Japan Nickel-Based Superalloys for Aerospace Market Size, by Alloy Grade, 2017-2040 (USD Million)

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ABD-1000AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
ABD-900AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 479 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
AD730	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy 718Plus	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy X-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CM247LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CMSX-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hastelloy X	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713C	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-738LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
MAR-M xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic 80A	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene 88DT	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 479 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
RR1000	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet 720Li	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Waspaloy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. ATI Inc. - 2025 Form 10-K

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC's reported financial/product-category inputs and listed ingot offering constrain the eligible material envelope; the ingot allocation remains assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: AA&S sales of USD xx.xx and its xx.xx% nickel-based/specialty-alloy category anchor the separately adjusted rolled-material envelope.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial jet-engine revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025, supporting purchasing recovery but not identifying price growth or a 2032 material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))

2. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
3. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Narrow-strip supply supports a limited flat-product allocation within the modeled eligible Carpenter envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire is a disclosed supplied form; its eligible monetary weight remains modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.

4. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical xx.xx% slab/bar/billet revenue category constrains the long-stock proxy; its eligible billet split is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported combined stock category provides a proxy anchor, not a separately disclosed bar revenue share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 flat products represented approximately xx.xx% of net product revenue; extrapolation to the eligible Acerinox envelope is modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 wire represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 tubulars represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical product revenue, channel mix and backlog conversion anchor the modeled stock value weight, with explicit scope adjustments.

5. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Casting-alloy activities support an ingot-material equivalent rather than attributing full engine-component revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed metal/billet activities support retaining a forging-stock allocation; the assumed xx.xx% weight is not reported.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported 2025 sales of USD xx.xx and Engine Products aerospace revenues of USD xx.xx commercial and USD xx.xx defense establish the component-cohort scale; USD xx.xx gas-turbine revenue is excluded through an explicit attribution model. These are not material-market revenues. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The segment/end-market revenue table supplies the aerospace and gas-turbine boundaries needed to bridge combined spares activity into an aerospace replacement-material proxy. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial aerospace represented xx.xx% of 2025 company sales, supplying an independent downstream mix comparison rather than a nickel-material allocation weight. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense aerospace represented xx.xx% of 2025 company sales; the paired commercial/defense comparison tests the aviation model while retaining component and material-scope differences. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.

6. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: GE describes repaired/serviceable-part reuse, supporting a counterforce to converting aftermarket activity directly into newly supplied material purchases. Its reported approximately xx.xx% strategic-nickel revert content is not deducted from the terminal-material market. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Commercial repair and component reuse support retaining uncertainty around replacement-related combustion material purchases. The selected procurement-intensity offset remains an assumption, not a measured avoided-purchase percentage. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
7. Special Metals - Tech Center
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised ingot supply establishes a PCC material-form crosswalk, not its sales weight.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised billet supply supports the forging-stock category mapping within the inherited PCC envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised bar supply supports classification only; the monetary coefficient is an assumption.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Plate, sheet and strip offerings support a distinct flat-product allocation premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire availability supports the material-form crosswalk without establishing revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Tubing availability supports the material-form crosswalk without establishing revenue.

8. DPC Holdings Limited - Registration Statement with 2025 Financial Statements
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing separates ingots from component sales and describes external supply and xx.xx% internal superalloy sourcing, contradicting the inherited xx.xx% captive parameter.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
9. Acerinox - Results FY 2025
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned US long-product expansion supports the relative conventional-long-material premise; investment is not recognized as sales.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately USD xx.xx of planned platform investment includes expansion of the long-products offering, informing the bars forecast premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace demand and planned long-product diversification support testing a relative mix shift without assuming flat-product contraction.
10. Haynes International - HAYNES 282
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Powder is offered alongside conventional forms for HAYNES xx.xx supporting nonexclusive form classification, not an observed sales allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))

11. CMA - Anticipated Acquisition of Haynes International by Acerinox: Full Text Decision
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct customer evidence in paragraphs xx.xx-xx.xx supports separate flat/long purchasing pools; no published market-share table is used.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Shape-specific purchasing supports a distinct long-stock allocation model without proving a separate competitive market for billet.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
12. Haynes International - HAYNES 230
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))

13. Carpenter Technology - Advanced Materials for Aerospace Motor & Engines

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation.
([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation.
([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))

14. Elementum 3D - Metal Alloy Additive Manufacturing Colorado

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed.
([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed.
([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))

15. NASA - NASA-Developed Printable Metal Can Take the Heat

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake.
([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake.
([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

16. Carpenter Technology - Lighter, Faster, Stronger Metallurgy for Defense, July 2025

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

17. Special Metals - Aerospace
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy xx.xx; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy X-xx.xx; no current sales quantity is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Waspaloy; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

18. Boeing - BDS Terms and Conditions Guide, D607 Material Substitution Prohibition, November 15, 2013
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: D607 prohibits unauthorized material substitutions while recognizing specified alternatives. It constrains assumptions about frictionless cross-class substitution, without quantifying adoption delays. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization requirements qualify assumptions about precipitation-family substitution opportunities; the clause does not prove future purchases or a class-growth premium. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause prohibits unauthorized substitutions where contractually applicable. It constrains the adoption interpretation but does not establish approval prevalence or a numerical adoption rate. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific material authorization is a counterweight to treating a named offering as immediately substitutable production material. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization limits interpretation of the assumed adoption multiplier; it does not directly establish powder sales. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))

19. Precision Castparts Corp. - Fiscal 2015 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
20. NASA - Chapter 2: Aerospace Materials Characteristics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

21. ESA - ESA Space Environment Report 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
22. NASA and Superalloys: A Customer, a Participant, and a Referee
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
23. VDM Metals - Alloys for the Aerospace Industry
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
24. Carpenter Technology - Business Segments
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))

25. Howmet Aerospace - 2025 Annual Report, Letter to Shareholders

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% combined aerospace and gas-turbine spares revenue constrains the distinction between initial-production and spare-component activity; material and destination adjustments remain modeled. ([howmet.com](https://www.howmet.com/annualreport/))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed combined spares proportion supplies the replacement proxy; approximately xx.xx% commercial aerospace engine-spares growth is historical counterevidence against assuming weak aftermarket activity. ([howmet.com](https://www.howmet.com/annualreport/))

26. GE Aerospace - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment and services costs provide commercial budget anchors for the common material-value denominator; assumed eligible-material fractions prevent full equipment or service value from entering the allocation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Services include spare parts and maintenance activity, supporting an explicit new-article versus restoration attribution rather than equating services revenue with replacement-material purchases. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported USD xx.xx services cost anchors the restoration-material bridge; the restoration allocation and direct eligible-material fraction are assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Total funded R&D of USD xx.xx supplies a development-budget proxy, not observed nickel-material purchasing; only an assumed eligible-material fraction is used. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.

27. Rolls-Royce Holdings Plc - 2025 Full Year Results

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2028 shop-visit target is below the reported 2025 total despite prospective fleet growth, qualifying any automatic conversion of fleet expansion into proportionate maintenance-material purchasing.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The divergence between 2025 engine deliveries and shop visits independently challenges a uniform new-engine-led material forecast; no service revenue is included in the numerator.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Observed engine-delivery and shop-visit activity supports separate new-program and replacement-demand assumptions, not a proportional material-purchase conversion.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

28. UKRI - Accelerating Manufacturing Readiness level of ABD-1000AM for AM of high temperature aerospace components (AMRAM1000)
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The Alloyed-led project has xx.xx of funding and an April 2025-October 2026 funded period. This independently establishes bounded development activity, not annual material sales or recurring production purchases. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
29. Safran - FY 2025 Results and Investor Update, February 13, 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))

30. Airbus - Full-Year 2025 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 deliveries by aircraft family provide the starting activity comparison for the initial-production forecast; aircraft delivery value is not included in the material numerator. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx% decline in 2025 self-financed R&D is counterevidence to uniform development-budget acceleration and supports a restrained, explicitly assumed development-purchasing scenario. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.

31. Airbus - Half-Year 2026 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 update retained the A320-family, A350 and other production-rate targets, providing a dated commercial constraint on the initial-production activity scenario rather than proof of future material orders. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: First-half 2026 self-financed R&D of EUR xx.xx versus EUR xx.xx provides a modest-growth countercheck for the assumed development-project activity path; the budget is not material-market revenue. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))

32. RTX Corporation - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

33. Federal Reserve Bank of St. Louis - Annual USD/GBP Exchange Rate, AEXUSUK
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
34. L3Harris Technologies, Inc. - Fiscal 2025 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
35. FAA Aerospace Forecast Fiscal Years 2025-2045 - Commercial Space
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated official low/high scenarios provide FY2032 licensed launch/reentry activity bounds. Their U.S.-licensed scope and treatment of reusable vehicles prevent direct conversion into Global material revenue. ([faa.gov](https://www.faa.gov/data_research/aviation/aerospace_forecasts/2025-commercial-space.pdf))
36. ICAO - Convention on International Civil Aviation, Ninth Edition
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))

37. DFARS 252.225-7009 - Restriction on Acquisition of Certain Articles Containing Specialty Metals
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
38. Aubert & Duval - Space Industry Metallurgical Solutions
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
39. Aubert & Duval - Metallurgical Solutions for the Defense Industry, June 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
40. Berkshire Hathaway Inc. - 2025 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.

41. Lufthansa Group Annual Report 2025 - MRO business segment
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
42. Oliver Wyman - Global Fleet And MRO Market Forecast 2026-2036: Key Trends
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
43. German Aerospace Center (DLR) - Financing
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
44. Federal Aviation Administration - Parts Manufacturer Approval (PMA): Design Approval
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.

45. Rolled Alloys - E-Services Stocking Programs
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
46. Boeing BDS Terms and Conditions Guide - D604 Raw Material Risk Mitigation
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
47. Carpenter Technology Corporation - Second Quarter Fiscal 2026 Earnings Call Presentation, January 29, 2026
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation distinguishes specialized non-LTA business from a conventional spot market, countering automatic classification of transactional sales as stock.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Three additional aerospace LTAs and xx.xx% sequential commercial-aerospace bookings growth inform the reservation hypothesis, but do not measure its modeled magnitude.
48. Precision Castparts Corp. - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.

49. Howmet Aerospace - United States Locations
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.

50. ATI Inc. - 2024 Annual Report
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New sales commitments through 2040, including amounts expected during the remainder of the decade and predominantly involving jet-engine nickel alloys, inform the direct-program forecast premise without being counted as realized sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% of fiscal-2024 plate volume went to independent service centers, providing a historical comparison that cautions against assuming generalized intermediary displacement.

51. Alloyed - About
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.

52. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 aerospace realization and revenue provide the common monetary calibration for this modeled grade; neither is a grade-specific sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace material realization supplies a price-scale input, with modeled year and product-mix adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization calibrates the assumed blended material price, not this grade's observed revenue. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace realization provides a shared monetary comparison for the assumed grade price. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported eight-to-ten-year aerospace application-introduction periods constrain interpretation of the seven-year adoption forecast. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace application-introduction periods provide an adoption-delay counterweight, not a forecast sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
53. European Commission CORDIS - Welding Metallurgy and Cracking in Superalloys: Reporting
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical all-sector tonnage discussion is only a dominance cross-check; it cannot establish current aerospace monetary share. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies 718Plus separately from ordinary xx.xx supporting identity separation without supplying a current sales weight. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
54. Special Metals - Alloy Surcharge Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: August-October 2026 grade surcharges provide a differentiated cost-exposure check, not full invoice prices or observed 2032 prices. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx surcharge sequence independently qualifies a uniform price assumption; it is not substituted for a material selling price. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The grade-specific surcharge listing is a commercial cost comparison, not an observed Global grade realization. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))

55. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current-and-past supplier identity mapping only; not proof of 2025 aerospace sales or the modeled volume. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: CMSX-xx.xx is separately identified; the material-value weight remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current sales are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713C is listed separately from IN-713LC; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713LC is listed separately from IN-713C; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx identity mapping only; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-738LC is separately identified; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current aerospace tonnes are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx appears in a current-and-past identification list; this does not establish recurring aerospace production sales. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: MAR-M xx.xx is identified separately from CM247LC; monetary weights remain modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PWA xx.xx is separately identified; no attributable sales value is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; current commercial scale remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; no current grade-specific material sales are disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Udimet xx.xx appears in the supplier's current-and-past identities; aerospace attribution is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

56. GE Aerospace - Safety First: A Retiring GE Aerospace Materials Engineer Made Protecting Lives His Mission
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
57. Aubert & Duval - AD730: Ni-Based Superalloy for High Temperature Applications
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
58. University of Portsmouth - Improved Creep-Fatigue-Oxidation Resistance in Gas Turbine Disc Materials: REF Impact Case Study
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))

59. Influence of Long Term Exposure in Air on Microstructure, Surface Stability and Mechanical Properties of UDIMET 720LI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The aerospace-industry publication distinguishes conventional Udimet xx.xx from its 720Li derivative; it does not establish a current monetary allocation. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The publication independently supports the 720Li identity and aircraft-engine-disc category, without supplying current sales. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

60. NASA Contractor Report 174639 - Literature Survey on Oxidations and Fatigue Lives at Elevated Temperatures

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical institutional material identification is a legacy-category anchor only; it does not demonstrate current aerospace material sales. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

61. America Makes - 5566.002 Proliferation of Nickel Superalloy Material Datasets for Powder Bed Fusion Additive Manufacturing

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))

62. GE Aerospace - Fourth Quarter 2025 Earnings Presentation

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 commercial-engine delivery growth supplies a near-term demand cross-check, not a grade-specific purchasing or seven-year growth observation. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aggregate commercial and defense delivery growth constrains the commercial-demand scenario without establishing this grade's attributable consumption. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported defense-engine delivery growth is a demand-exposure check only; the PWA xx.xx activity factor remains assumed. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

18.8. Italy

Table 480. Italy Nickel-Based Superalloys for Aerospace Market Size, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Italy	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 481. Italy Nickel-Based Superalloys for Aerospace Market Size, by Product Form, 2017-2040 (USD Million)

Product Form	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Bars, Rods and Profiles	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Billets and Forging Stock	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ingots	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Plate, Sheet, Strip and Foil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Powder	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Tubes and Pipes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Wire	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 482. Italy Nickel-Based Superalloys for Aerospace Market Size, by Strengthening Class, 2017-2040 (USD Million)

Strengthening Class	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Dispersion-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Precipitation-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Solid-Solution-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 483. Italy Nickel-Based Superalloys for Aerospace Market Size, by Component Application, 2017-2040 (USD Million)

Component Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Breathing Propulsion & Auxiliary Power	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Systems & Equipment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rocket & Spacecraft Propulsion	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Vehicle Structures & Thermal Protection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 484. Italy Nickel-Based Superalloys for Aerospace Market Size, by Air-Breathing Propulsion & Auxiliary Power, 2017-2040 (USD Million)

Air-Breathing Propulsion & Auxiliary Power	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combustion & Exhaust Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Compressor Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine Structures & Auxiliary Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Blades & Vanes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Disks & Rotor Hardware	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 485. Italy Nickel-Based Superalloys for Aerospace Market Size, by Demand Stage, 2017-2040 (USD Million)

Demand Stage	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Initial Equipment Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Repair, Overhaul & Refurbishment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Replacement & Retrofit Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research, Development & Qualification	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 486. Italy Nickel-Based Superalloys for Aerospace Market Size, by Aerospace End Market, 2017-2040 (USD Million)

Aerospace End Market	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Civil & Nonmilitary State Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Guided Missile Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Military Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Space Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 487. Italy Nickel-Based Superalloys for Aerospace Market Size, by Buyer Function, 2017-2040 (USD Million)

Buyer Function	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Aerospace Vehicle Manufacturers & Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Component & Subassembly Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine & Propulsion-System Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Maintenance, Repair & Overhaul Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Development Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 488. Italy Nickel-Based Superalloys for Aerospace Market Size, by Fulfillment Model, 2017-2040 (USD Million)

Fulfillment Model	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Order-Dedicated Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stock Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 489. Italy Nickel-Based Superalloys for Aerospace Market Size, by Supply Channel, 2017-2040 (USD Million)

Supply Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Captive Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent Intermediary Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Producer-Direct Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 490. Italy Nickel-Based Superalloys for Aerospace Market Size, by Alloy Grade, 2017-2040 (USD Million)

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ABD-1000AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
ABD-900AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 490 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
AD730	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy 718Plus	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy X-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CM247LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CMSX-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hastelloy X	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713C	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-738LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
MAR-M xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic 80A	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene 88DT	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 490 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
RR1000	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet 720Li	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Waspaloy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. ATI Inc. - 2025 Form 10-K

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC's reported financial/product-category inputs and listed ingot offering constrain the eligible material envelope; the ingot allocation remains assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: AA&S sales of USD xx.xx and its xx.xx% nickel-based/specialty-alloy category anchor the separately adjusted rolled-material envelope.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial jet-engine revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025, supporting purchasing recovery but not identifying price growth or a 2032 material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))

2. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
3. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Narrow-strip supply supports a limited flat-product allocation within the modeled eligible Carpenter envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire is a disclosed supplied form; its eligible monetary weight remains modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.

4. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical xx.xx% slab/bar/billet revenue category constrains the long-stock proxy; its eligible billet split is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported combined stock category provides a proxy anchor, not a separately disclosed bar revenue share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 flat products represented approximately xx.xx% of net product revenue; extrapolation to the eligible Acerinox envelope is modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 wire represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 tubulars represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical product revenue, channel mix and backlog conversion anchor the modeled stock value weight, with explicit scope adjustments.

5. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Casting-alloy activities support an ingot-material equivalent rather than attributing full engine-component revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed metal/billet activities support retaining a forging-stock allocation; the assumed xx.xx% weight is not reported.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported 2025 sales of USD xx.xx and Engine Products aerospace revenues of USD xx.xx commercial and USD xx.xx defense establish the component-cohort scale; USD xx.xx gas-turbine revenue is excluded through an explicit attribution model. These are not material-market revenues. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The segment/end-market revenue table supplies the aerospace and gas-turbine boundaries needed to bridge combined spares activity into an aerospace replacement-material proxy. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial aerospace represented xx.xx% of 2025 company sales, supplying an independent downstream mix comparison rather than a nickel-material allocation weight. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense aerospace represented xx.xx% of 2025 company sales; the paired commercial/defense comparison tests the aviation model while retaining component and material-scope differences. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.

6. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: GE describes repaired/serviceable-part reuse, supporting a counterforce to converting aftermarket activity directly into newly supplied material purchases. Its reported approximately xx.xx% strategic-nickel revert content is not deducted from the terminal-material market. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Commercial repair and component reuse support retaining uncertainty around replacement-related combustion material purchases. The selected procurement-intensity offset remains an assumption, not a measured avoided-purchase percentage. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
7. Special Metals - Tech Center
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised ingot supply establishes a PCC material-form crosswalk, not its sales weight.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised billet supply supports the forging-stock category mapping within the inherited PCC envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised bar supply supports classification only; the monetary coefficient is an assumption.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Plate, sheet and strip offerings support a distinct flat-product allocation premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire availability supports the material-form crosswalk without establishing revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Tubing availability supports the material-form crosswalk without establishing revenue.

8. DPC Holdings Limited - Registration Statement with 2025 Financial Statements
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing separates ingots from component sales and describes external supply and xx.xx% internal superalloy sourcing, contradicting the inherited xx.xx% captive parameter.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
9. Acerinox - Results FY 2025
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned US long-product expansion supports the relative conventional-long-material premise; investment is not recognized as sales.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately USD xx.xx of planned platform investment includes expansion of the long-products offering, informing the bars forecast premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace demand and planned long-product diversification support testing a relative mix shift without assuming flat-product contraction.
10. Haynes International - HAYNES 282
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Powder is offered alongside conventional forms for HAYNES xx.xx supporting nonexclusive form classification, not an observed sales allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))

11. CMA - Anticipated Acquisition of Haynes International by Acerinox: Full Text Decision
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct customer evidence in paragraphs xx.xx-xx.xx supports separate flat/long purchasing pools; no published market-share table is used.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Shape-specific purchasing supports a distinct long-stock allocation model without proving a separate competitive market for billet.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
12. Haynes International - HAYNES 230
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))

13. Carpenter Technology - Advanced Materials for Aerospace Motor & Engines

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation.
([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation.
([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))

14. Elementum 3D - Metal Alloy Additive Manufacturing Colorado

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed.
([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed.
([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))

15. NASA - NASA-Developed Printable Metal Can Take the Heat

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake.
([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake.
([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

16. Carpenter Technology - Lighter, Faster, Stronger Metallurgy for Defense, July 2025

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

17. Special Metals - Aerospace
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy xx.xx; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy X-xx.xx; no current sales quantity is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Waspaloy; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

18. Boeing - BDS Terms and Conditions Guide, D607 Material Substitution Prohibition, November 15, 2013
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: D607 prohibits unauthorized material substitutions while recognizing specified alternatives. It constrains assumptions about frictionless cross-class substitution, without quantifying adoption delays. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization requirements qualify assumptions about precipitation-family substitution opportunities; the clause does not prove future purchases or a class-growth premium. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause prohibits unauthorized substitutions where contractually applicable. It constrains the adoption interpretation but does not establish approval prevalence or a numerical adoption rate. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific material authorization is a counterweight to treating a named offering as immediately substitutable production material. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization limits interpretation of the assumed adoption multiplier; it does not directly establish powder sales. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))

19. Precision Castparts Corp. - Fiscal 2015 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
20. NASA - Chapter 2: Aerospace Materials Characteristics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

21. ESA - ESA Space Environment Report 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
22. NASA and Superalloys: A Customer, a Participant, and a Referee
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
23. VDM Metals - Alloys for the Aerospace Industry
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
24. Carpenter Technology - Business Segments
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))

25. Howmet Aerospace - 2025 Annual Report, Letter to Shareholders

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% combined aerospace and gas-turbine spares revenue constrains the distinction between initial-production and spare-component activity; material and destination adjustments remain modeled. ([howmet.com](https://www.howmet.com/annualreport/))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed combined spares proportion supplies the replacement proxy; approximately xx.xx% commercial aerospace engine-spares growth is historical counterevidence against assuming weak aftermarket activity. ([howmet.com](https://www.howmet.com/annualreport/))

26. GE Aerospace - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment and services costs provide commercial budget anchors for the common material-value denominator; assumed eligible-material fractions prevent full equipment or service value from entering the allocation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Services include spare parts and maintenance activity, supporting an explicit new-article versus restoration attribution rather than equating services revenue with replacement-material purchases. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported USD xx.xx services cost anchors the restoration-material bridge; the restoration allocation and direct eligible-material fraction are assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Total funded R&D of USD xx.xx supplies a development-budget proxy, not observed nickel-material purchasing; only an assumed eligible-material fraction is used. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.

27. Rolls-Royce Holdings Plc - 2025 Full Year Results

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2028 shop-visit target is below the reported 2025 total despite prospective fleet growth, qualifying any automatic conversion of fleet expansion into proportionate maintenance-material purchasing.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The divergence between 2025 engine deliveries and shop visits independently challenges a uniform new-engine-led material forecast; no service revenue is included in the numerator.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Observed engine-delivery and shop-visit activity supports separate new-program and replacement-demand assumptions, not a proportional material-purchase conversion.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

28. UKRI - Accelerating Manufacturing Readiness level of ABD-1000AM for AM of high temperature aerospace components (AMRAM1000)
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The Alloyed-led project has xx.xx of funding and an April 2025-October 2026 funded period. This independently establishes bounded development activity, not annual material sales or recurring production purchases. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
29. Safran - FY 2025 Results and Investor Update, February 13, 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))

30. Airbus - Full-Year 2025 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 deliveries by aircraft family provide the starting activity comparison for the initial-production forecast; aircraft delivery value is not included in the material numerator. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx% decline in 2025 self-financed R&D is counterevidence to uniform development-budget acceleration and supports a restrained, explicitly assumed development-purchasing scenario. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.

31. Airbus - Half-Year 2026 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 update retained the A320-family, A350 and other production-rate targets, providing a dated commercial constraint on the initial-production activity scenario rather than proof of future material orders. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: First-half 2026 self-financed R&D of EUR xx.xx versus EUR xx.xx provides a modest-growth countercheck for the assumed development-project activity path; the budget is not material-market revenue. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))

32. RTX Corporation - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

33. Federal Reserve Bank of St. Louis - Annual USD/GBP Exchange Rate, AEXUSUK
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
34. L3Harris Technologies, Inc. - Fiscal 2025 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
35. FAA Aerospace Forecast Fiscal Years 2025-2045 - Commercial Space
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated official low/high scenarios provide FY2032 licensed launch/reentry activity bounds. Their U.S.-licensed scope and treatment of reusable vehicles prevent direct conversion into Global material revenue. ([faa.gov](https://www.faa.gov/data_research/aviation/aerospace_forecasts/2025-commercial-space.pdf))
36. ICAO - Convention on International Civil Aviation, Ninth Edition
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))

37. DFARS 252.225-7009 - Restriction on Acquisition of Certain Articles Containing Specialty Metals
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
38. Aubert & Duval - Space Industry Metallurgical Solutions
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
39. Aubert & Duval - Metallurgical Solutions for the Defense Industry, June 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
40. Berkshire Hathaway Inc. - 2025 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.

41. Lufthansa Group Annual Report 2025 - MRO business segment
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
42. Oliver Wyman - Global Fleet And MRO Market Forecast 2026-2036: Key Trends
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
43. German Aerospace Center (DLR) - Financing
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
44. Federal Aviation Administration - Parts Manufacturer Approval (PMA): Design Approval
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.

45. Rolled Alloys - E-Services Stocking Programs
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
46. Boeing BDS Terms and Conditions Guide - D604 Raw Material Risk Mitigation
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
47. Carpenter Technology Corporation - Second Quarter Fiscal 2026 Earnings Call Presentation, January 29, 2026
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation distinguishes specialized non-LTA business from a conventional spot market, countering automatic classification of transactional sales as stock.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Three additional aerospace LTAs and xx.xx% sequential commercial-aerospace bookings growth inform the reservation hypothesis, but do not measure its modeled magnitude.
48. Precision Castparts Corp. - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.

49. Howmet Aerospace - United States Locations
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.

50. ATI Inc. - 2024 Annual Report
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New sales commitments through 2040, including amounts expected during the remainder of the decade and predominantly involving jet-engine nickel alloys, inform the direct-program forecast premise without being counted as realized sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% of fiscal-2024 plate volume went to independent service centers, providing a historical comparison that cautions against assuming generalized intermediary displacement.

51. Alloyed - About
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.

52. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 aerospace realization and revenue provide the common monetary calibration for this modeled grade; neither is a grade-specific sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace material realization supplies a price-scale input, with modeled year and product-mix adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization calibrates the assumed blended material price, not this grade's observed revenue. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace realization provides a shared monetary comparison for the assumed grade price. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported eight-to-ten-year aerospace application-introduction periods constrain interpretation of the seven-year adoption forecast. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace application-introduction periods provide an adoption-delay counterweight, not a forecast sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
53. European Commission CORDIS - Welding Metallurgy and Cracking in Superalloys: Reporting
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical all-sector tonnage discussion is only a dominance cross-check; it cannot establish current aerospace monetary share. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies 718Plus separately from ordinary xx.xx supporting identity separation without supplying a current sales weight. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
54. Special Metals - Alloy Surcharge Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: August-October 2026 grade surcharges provide a differentiated cost-exposure check, not full invoice prices or observed 2032 prices. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx surcharge sequence independently qualifies a uniform price assumption; it is not substituted for a material selling price. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The grade-specific surcharge listing is a commercial cost comparison, not an observed Global grade realization. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))

55. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current-and-past supplier identity mapping only; not proof of 2025 aerospace sales or the modeled volume. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: CMSX-xx.xx is separately identified; the material-value weight remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current sales are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713C is listed separately from IN-713LC; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713LC is listed separately from IN-713C; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx identity mapping only; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-738LC is separately identified; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current aerospace tonnes are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx appears in a current-and-past identification list; this does not establish recurring aerospace production sales. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: MAR-M xx.xx is identified separately from CM247LC; monetary weights remain modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PWA xx.xx is separately identified; no attributable sales value is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; current commercial scale remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; no current grade-specific material sales are disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Udimet xx.xx appears in the supplier's current-and-past identities; aerospace attribution is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

56. GE Aerospace - Safety First: A Retiring GE Aerospace Materials Engineer Made Protecting Lives His Mission
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
57. Aubert & Duval - AD730: Ni-Based Superalloy for High Temperature Applications
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
58. University of Portsmouth - Improved Creep-Fatigue-Oxidation Resistance in Gas Turbine Disc Materials: REF Impact Case Study
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))

59. Influence of Long Term Exposure in Air on Microstructure, Surface Stability and Mechanical Properties of UDIMET 720LI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The aerospace-industry publication distinguishes conventional Udimet xx.xx from its 720Li derivative; it does not establish a current monetary allocation. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The publication independently supports the 720Li identity and aircraft-engine-disc category, without supplying current sales. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

60. NASA Contractor Report 174639 - Literature Survey on Oxidations and Fatigue Lives at Elevated Temperatures

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical institutional material identification is a legacy-category anchor only; it does not demonstrate current aerospace material sales. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

61. America Makes - 5566.002 Proliferation of Nickel Superalloy Material Datasets for Powder Bed Fusion Additive Manufacturing

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))

62. GE Aerospace - Fourth Quarter 2025 Earnings Presentation

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 commercial-engine delivery growth supplies a near-term demand cross-check, not a grade-specific purchasing or seven-year growth observation. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aggregate commercial and defense delivery growth constrains the commercial-demand scenario without establishing this grade's attributable consumption. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported defense-engine delivery growth is a demand-exposure check only; the PWA xx.xx activity factor remains assumed. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

18.9. Russia

Table 491. Russia Nickel-Based Superalloys for Aerospace Market Size, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Russia	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 492. Russia Nickel-Based Superalloys for Aerospace Market Size, by Product Form, 2017-2040 (USD Million)

Product Form	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Bars, Rods and Profiles	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Billets and Forging Stock	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ingots	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Plate, Sheet, Strip and Foil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Powder	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Tubes and Pipes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Wire	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 493. Russia Nickel-Based Superalloys for Aerospace Market Size, by Strengthening Class, 2017-2040 (USD Million)

Strengthening Class	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Dispersion-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Precipitation-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Solid-Solution-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 494. Russia Nickel-Based Superalloys for Aerospace Market Size, by Component Application, 2017-2040 (USD Million)

Component Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Breathing Propulsion & Auxiliary Power	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Systems & Equipment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rocket & Spacecraft Propulsion	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Vehicle Structures & Thermal Protection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 495. Russia Nickel-Based Superalloys for Aerospace Market Size, by Air-Breathing Propulsion & Auxiliary Power, 2017-2040 (USD Million)

Air-Breathing Propulsion & Auxiliary Power	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combustion & Exhaust Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Compressor Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine Structures & Auxiliary Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Blades & Vanes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Disks & Rotor Hardware	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 496. Russia Nickel-Based Superalloys for Aerospace Market Size, by Demand Stage, 2017-2040 (USD Million)

Demand Stage	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Initial Equipment Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Repair, Overhaul & Refurbishment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Replacement & Retrofit Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research, Development & Qualification	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 497. Russia Nickel-Based Superalloys for Aerospace Market Size, by Aerospace End Market, 2017-2040 (USD Million)

Aerospace End Market	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Civil & Nonmilitary State Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Guided Missile Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Military Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Space Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 498. Russia Nickel-Based Superalloys for Aerospace Market Size, by Buyer Function, 2017-2040 (USD Million)

Buyer Function	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Aerospace Vehicle Manufacturers & Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Component & Subassembly Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine & Propulsion-System Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Maintenance, Repair & Overhaul Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Development Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 499. Russia Nickel-Based Superalloys for Aerospace Market Size, by Fulfillment Model, 2017-2040 (USD Million)

Fulfillment Model	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Order-Dedicated Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stock Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 500. Russia Nickel-Based Superalloys for Aerospace Market Size, by Supply Channel, 2017-2040 (USD Million)

Supply Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Captive Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent Intermediary Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Producer-Direct Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 501. Russia Nickel-Based Superalloys for Aerospace Market Size, by Alloy Grade, 2017-2040 (USD Million)

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ABD-1000AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
ABD-900AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 501 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
AD730	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy 718Plus	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy X-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CM247LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CMSX-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hastelloy X	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713C	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-738LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
MAR-M xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic 80A	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene 88DT	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 501 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
RR1000	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet 720Li	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Waspaloy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. ATI Inc. - 2025 Form 10-K

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC's reported financial/product-category inputs and listed ingot offering constrain the eligible material envelope; the ingot allocation remains assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: AA&S sales of USD xx.xx and its xx.xx% nickel-based/specialty-alloy category anchor the separately adjusted rolled-material envelope.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial jet-engine revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025, supporting purchasing recovery but not identifying price growth or a 2032 material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))

2. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
3. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Narrow-strip supply supports a limited flat-product allocation within the modeled eligible Carpenter envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire is a disclosed supplied form; its eligible monetary weight remains modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.

4. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical xx.xx% slab/bar/billet revenue category constrains the long-stock proxy; its eligible billet split is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported combined stock category provides a proxy anchor, not a separately disclosed bar revenue share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 flat products represented approximately xx.xx% of net product revenue; extrapolation to the eligible Acerinox envelope is modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 wire represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 tubulars represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical product revenue, channel mix and backlog conversion anchor the modeled stock value weight, with explicit scope adjustments.

5. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Casting-alloy activities support an ingot-material equivalent rather than attributing full engine-component revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed metal/billet activities support retaining a forging-stock allocation; the assumed xx.xx% weight is not reported.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported 2025 sales of USD xx.xx and Engine Products aerospace revenues of USD xx.xx commercial and USD xx.xx defense establish the component-cohort scale; USD xx.xx gas-turbine revenue is excluded through an explicit attribution model. These are not material-market revenues. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The segment/end-market revenue table supplies the aerospace and gas-turbine boundaries needed to bridge combined spares activity into an aerospace replacement-material proxy. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial aerospace represented xx.xx% of 2025 company sales, supplying an independent downstream mix comparison rather than a nickel-material allocation weight. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense aerospace represented xx.xx% of 2025 company sales; the paired commercial/defense comparison tests the aviation model while retaining component and material-scope differences. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.

6. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: GE describes repaired/serviceable-part reuse, supporting a counterforce to converting aftermarket activity directly into newly supplied material purchases. Its reported approximately xx.xx% strategic-nickel revert content is not deducted from the terminal-material market. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Commercial repair and component reuse support retaining uncertainty around replacement-related combustion material purchases. The selected procurement-intensity offset remains an assumption, not a measured avoided-purchase percentage. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
7. World Bank WITS / UN Comtrade - Bars, rods and profiles, nickel alloy imports by country, 2021
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2021 Russian bar-import value is the historical primitive; current scope, domestic coverage and temporal rebase are assumptions.
8. Special Metals - Tech Center
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised ingot supply establishes a PCC material-form crosswalk, not its sales weight.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised billet supply supports the forging-stock category mapping within the inherited PCC envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised bar supply supports classification only; the monetary coefficient is an assumption.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Plate, sheet and strip offerings support a distinct flat-product allocation premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire availability supports the material-form crosswalk without establishing revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Tubing availability supports the material-form crosswalk without establishing revenue.

9. DPC Holdings Limited - Registration Statement with 2025 Financial Statements
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing separates ingots from component sales and describes external supply and xx.xx% internal superalloy sourcing, contradicting the inherited xx.xx% captive parameter.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
10. Acerinox - Results FY 2025
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned US long-product expansion supports the relative conventional-long-material premise; investment is not recognized as sales.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately USD xx.xx of planned platform investment includes expansion of the long-products offering, informing the bars forecast premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace demand and planned long-product diversification support testing a relative mix shift without assuming flat-product contraction.
11. Haynes International - HAYNES 282
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Powder is offered alongside conventional forms for HAYNES xx.xx supporting nonexclusive form classification, not an observed sales allocation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))

12. CMA - Anticipated Acquisition of Haynes International by Acerinox: Full Text Decision
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct customer evidence in paragraphs xx.xx-xx.xx supports separate flat/long purchasing pools; no published market-share table is used.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Shape-specific purchasing supports a distinct long-stock allocation model without proving a separate competitive market for billet.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
13. Haynes International - HAYNES 230
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))

14. Carpenter Technology - Advanced Materials for Aerospace Motor & Engines

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation.
([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation.
([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))

15. Elementum 3D - Metal Alloy Additive Manufacturing Colorado

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed.
([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed.
([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))

16. NASA - NASA-Developed Printable Metal Can Take the Heat

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake.
([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake.
([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

17. Carpenter Technology - Lighter, Faster, Stronger Metallurgy for Defense, July 2025

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

18. Special Metals - Aerospace
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy xx.xx; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy X-xx.xx; no current sales quantity is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Waspaloy; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

19. Boeing - BDS Terms and Conditions Guide, D607 Material Substitution Prohibition, November 15, 2013
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: D607 prohibits unauthorized material substitutions while recognizing specified alternatives. It constrains assumptions about frictionless cross-class substitution, without quantifying adoption delays. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization requirements qualify assumptions about precipitation-family substitution opportunities; the clause does not prove future purchases or a class-growth premium. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause prohibits unauthorized substitutions where contractually applicable. It constrains the adoption interpretation but does not establish approval prevalence or a numerical adoption rate. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific material authorization is a counterweight to treating a named offering as immediately substitutable production material. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization limits interpretation of the assumed adoption multiplier; it does not directly establish powder sales. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))

20. Precision Castparts Corp. - Fiscal 2015 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
21. NASA - Chapter 2: Aerospace Materials Characteristics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

22. ESA - ESA Space Environment Report 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
23. NASA and Superalloys: A Customer, a Participant, and a Referee
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
24. VDM Metals - Alloys for the Aerospace Industry
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
25. Carpenter Technology - Business Segments
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))

26. Howmet Aerospace - 2025 Annual Report, Letter to Shareholders

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% combined aerospace and gas-turbine spares revenue constrains the distinction between initial-production and spare-component activity; material and destination adjustments remain modeled. ([howmet.com](https://www.howmet.com/annualreport/))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed combined spares proportion supplies the replacement proxy; approximately xx.xx% commercial aerospace engine-spares growth is historical counterevidence against assuming weak aftermarket activity. ([howmet.com](https://www.howmet.com/annualreport/))

27. GE Aerospace - 2025 Form 10-K

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment and services costs provide commercial budget anchors for the common material-value denominator; assumed eligible-material fractions prevent full equipment or service value from entering the allocation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Services include spare parts and maintenance activity, supporting an explicit new-article versus restoration attribution rather than equating services revenue with replacement-material purchases. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported USD xx.xx services cost anchors the restoration-material bridge; the restoration allocation and direct eligible-material fraction are assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Total funded R&D of USD xx.xx supplies a development-budget proxy, not observed nickel-material purchasing; only an assumed eligible-material fraction is used. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.

28. Rolls-Royce Holdings Plc - 2025 Full Year Results

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2028 shop-visit target is below the reported 2025 total despite prospective fleet growth, qualifying any automatic conversion of fleet expansion into proportionate maintenance-material purchasing.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The divergence between 2025 engine deliveries and shop visits independently challenges a uniform new-engine-led material forecast; no service revenue is included in the numerator.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Observed engine-delivery and shop-visit activity supports separate new-program and replacement-demand assumptions, not a proportional material-purchase conversion.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

29. UKRI - Accelerating Manufacturing Readiness level of ABD-1000AM for AM of high temperature aerospace components (AMRAM1000)
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The Alloyed-led project has xx.xx of funding and an April 2025-October 2026 funded period. This independently establishes bounded development activity, not annual material sales or recurring production purchases. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
30. Safran - FY 2025 Results and Investor Update, February 13, 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))

31. Airbus - Full-Year 2025 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 deliveries by aircraft family provide the starting activity comparison for the initial-production forecast; aircraft delivery value is not included in the material numerator. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx% decline in 2025 self-financed R&D is counterevidence to uniform development-budget acceleration and supports a restrained, explicitly assumed development-purchasing scenario. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.

32. Airbus - Half-Year 2026 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 update retained the A320-family, A350 and other production-rate targets, providing a dated commercial constraint on the initial-production activity scenario rather than proof of future material orders. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: First-half 2026 self-financed R&D of EUR xx.xx versus EUR xx.xx provides a modest-growth countercheck for the assumed development-project activity path; the budget is not material-market revenue. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))

33. RTX Corporation - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

34. Federal Reserve Bank of St. Louis - Annual USD/GBP Exchange Rate, AEXUSUK
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
35. L3Harris Technologies, Inc. - Fiscal 2025 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
36. FAA Aerospace Forecast Fiscal Years 2025-2045 - Commercial Space
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated official low/high scenarios provide FY2032 licensed launch/reentry activity bounds. Their U.S.-licensed scope and treatment of reusable vehicles prevent direct conversion into Global material revenue. ([faa.gov](https://www.faa.gov/data_research/aviation/aerospace_forecasts/2025-commercial-space.pdf))
37. ICAO - Convention on International Civil Aviation, Ninth Edition
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))

38. DFARS 252.225-7009 - Restriction on Acquisition of Certain Articles Containing Specialty Metals
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
39. Aubert & Duval - Space Industry Metallurgical Solutions
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
40. Aubert & Duval - Metallurgical Solutions for the Defense Industry, June 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
41. Berkshire Hathaway Inc. - 2025 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.

42. Lufthansa Group Annual Report 2025 - MRO business segment
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
43. Oliver Wyman - Global Fleet And MRO Market Forecast 2026-2036: Key Trends
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
44. German Aerospace Center (DLR) - Financing
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
45. Federal Aviation Administration - Parts Manufacturer Approval (PMA): Design Approval
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.

46. Rolled Alloys - E-Services Stocking Programs
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
47. Boeing BDS Terms and Conditions Guide - D604 Raw Material Risk Mitigation
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
48. Carpenter Technology Corporation - Second Quarter Fiscal 2026 Earnings Call Presentation, January 29, 2026
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation distinguishes specialized non-LTA business from a conventional spot market, countering automatic classification of transactional sales as stock.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Three additional aerospace LTAs and xx.xx% sequential commercial-aerospace bookings growth inform the reservation hypothesis, but do not measure its modeled magnitude.
49. Precision Castparts Corp. - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.

50. Howmet Aerospace - United States Locations
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
51. ATI Inc. - 2024 Annual Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New sales commitments through 2040, including amounts expected during the remainder of the decade and predominantly involving jet-engine nickel alloys, inform the direct-program forecast premise without being counted as realized sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% of fiscal-2024 plate volume went to independent service centers, providing a historical comparison that cautions against assuming generalized intermediary displacement.
52. Alloyed - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.

53. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 aerospace realization and revenue provide the common monetary calibration for this modeled grade; neither is a grade-specific sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace material realization supplies a price-scale input, with modeled year and product-mix adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization calibrates the assumed blended material price, not this grade's observed revenue. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace realization provides a shared monetary comparison for the assumed grade price. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported eight-to-ten-year aerospace application-introduction periods constrain interpretation of the seven-year adoption forecast. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace application-introduction periods provide an adoption-delay counterweight, not a forecast sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
54. European Commission CORDIS - Welding Metallurgy and Cracking in Superalloys: Reporting
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical all-sector tonnage discussion is only a dominance cross-check; it cannot establish current aerospace monetary share. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies 718Plus separately from ordinary xx.xx supporting identity separation without supplying a current sales weight. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
55. Special Metals - Alloy Surcharge Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: August-October 2026 grade surcharges provide a differentiated cost-exposure check, not full invoice prices or observed 2032 prices. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx surcharge sequence independently qualifies a uniform price assumption; it is not substituted for a material selling price. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The grade-specific surcharge listing is a commercial cost comparison, not an observed Global grade realization. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))

56. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current-and-past supplier identity mapping only; not proof of 2025 aerospace sales or the modeled volume. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: CMSX-xx.xx is separately identified; the material-value weight remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current sales are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713C is listed separately from IN-713LC; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713LC is listed separately from IN-713C; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx identity mapping only; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-738LC is separately identified; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current aerospace tonnes are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx appears in a current-and-past identification list; this does not establish recurring aerospace production sales. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: MAR-M xx.xx is identified separately from CM247LC; monetary weights remain modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PWA xx.xx is separately identified; no attributable sales value is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; current commercial scale remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; no current grade-specific material sales are disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Udimet xx.xx appears in the supplier's current-and-past identities; aerospace attribution is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

57. GE Aerospace - Safety First: A Retiring GE Aerospace Materials Engineer Made Protecting Lives His Mission
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
58. Aubert & Duval - AD730: Ni-Based Superalloy for High Temperature Applications
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
59. University of Portsmouth - Improved Creep-Fatigue-Oxidation Resistance in Gas Turbine Disc Materials: REF Impact Case Study
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))

60. Influence of Long Term Exposure in Air on Microstructure, Surface Stability and Mechanical Properties of UDIMET 720LI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The aerospace-industry publication distinguishes conventional Udimet xx.xx from its 720Li derivative; it does not establish a current monetary allocation. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The publication independently supports the 720Li identity and aircraft-engine-disc category, without supplying current sales. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))
61. NASA Contractor Report 174639 - Literature Survey on Oxidations and Fatigue Lives at Elevated Temperatures
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical institutional material identification is a legacy-category anchor only; it does not demonstrate current aerospace material sales. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
62. America Makes - 5566.002 Proliferation of Nickel Superalloy Material Datasets for Powder Bed Fusion Additive Manufacturing
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))
63. GE Aerospace - Fourth Quarter 2025 Earnings Presentation
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 commercial-engine delivery growth supplies a near-term demand cross-check, not a grade-specific purchasing or seven-year growth observation. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aggregate commercial and defense delivery growth constrains the commercial-demand scenario without establishing this grade's attributable consumption. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported defense-engine delivery growth is a demand-exposure check only; the PWA xx.xx activity factor remains assumed. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

18.10. Canada

Table 502. Canada Nickel-Based Superalloys for Aerospace Market Size, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Canada	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 503. Canada Nickel-Based Superalloys for Aerospace Market Size, by Product Form, 2017-2040 (USD Million)

Product Form	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Bars, Rods and Profiles	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Billets and Forging Stock	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ingots	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Plate, Sheet, Strip and Foil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Powder	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Tubes and Pipes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Wire	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 504. Canada Nickel-Based Superalloys for Aerospace Market Size, by Strengthening Class, 2017-2040 (USD Million)

Strengthening Class	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Dispersion-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Precipitation-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Solid-Solution-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 505. Canada Nickel-Based Superalloys for Aerospace Market Size, by Component Application, 2017-2040 (USD Million)

Component Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Breathing Propulsion & Auxiliary Power	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Systems & Equipment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rocket & Spacecraft Propulsion	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Vehicle Structures & Thermal Protection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 506. Canada Nickel-Based Superalloys for Aerospace Market Size, by Air-Breathing Propulsion & Auxiliary Power, 2017-2040 (USD Million)

Air-Breathing Propulsion & Auxiliary Power	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combustion & Exhaust Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Compressor Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine Structures & Auxiliary Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Blades & Vanes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Disks & Rotor Hardware	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 507. Canada Nickel-Based Superalloys for Aerospace Market Size, by Demand Stage, 2017-2040 (USD Million)

Demand Stage	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Initial Equipment Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Repair, Overhaul & Refurbishment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Replacement & Retrofit Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research, Development & Qualification	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 508. Canada Nickel-Based Superalloys for Aerospace Market Size, by Aerospace End Market, 2017-2040 (USD Million)

Aerospace End Market	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Civil & Nonmilitary State Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Guided Missile Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Military Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Space Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 509. Canada Nickel-Based Superalloys for Aerospace Market Size, by Buyer Function, 2017-2040 (USD Million)

Buyer Function	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Aerospace Vehicle Manufacturers & Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Component & Subassembly Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine & Propulsion-System Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Maintenance, Repair & Overhaul Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Development Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 510. Canada Nickel-Based Superalloys for Aerospace Market Size, by Fulfillment Model, 2017-2040 (USD Million)

Fulfillment Model	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Order-Dedicated Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stock Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 511. Canada Nickel-Based Superalloys for Aerospace Market Size, by Supply Channel, 2017-2040 (USD Million)

Supply Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Captive Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent Intermediary Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Producer-Direct Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 512. Canada Nickel-Based Superalloys for Aerospace Market Size, by Alloy Grade, 2017-2040 (USD Million)

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ABD-1000AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
ABD-900AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 512 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
AD730	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy 718Plus	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy X-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CM247LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CMSX-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hastelloy X	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713C	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-738LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
MAR-M xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic 80A	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene 88DT	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 512 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
RR1000	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet 720Li	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Waspaloy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. ATI Inc. - 2025 Form 10-K

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC's reported financial/product-category inputs and listed ingot offering constrain the eligible material envelope; the ingot allocation remains assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: AA&S sales of USD xx.xx and its xx.xx% nickel-based/specialty-alloy category anchor the separately adjusted rolled-material envelope.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial jet-engine revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025, supporting purchasing recovery but not identifying price growth or a 2032 material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))

2. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
3. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Narrow-strip supply supports a limited flat-product allocation within the modeled eligible Carpenter envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire is a disclosed supplied form; its eligible monetary weight remains modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.

4. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical xx.xx% slab/bar/billet revenue category constrains the long-stock proxy; its eligible billet split is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported combined stock category provides a proxy anchor, not a separately disclosed bar revenue share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 flat products represented approximately xx.xx% of net product revenue; extrapolation to the eligible Acerinox envelope is modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 wire represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 tubulars represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical product revenue, channel mix and backlog conversion anchor the modeled stock value weight, with explicit scope adjustments.

5. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Casting-alloy activities support an ingot-material equivalent rather than attributing full engine-component revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed metal/billet activities support retaining a forging-stock allocation; the assumed xx.xx% weight is not reported.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported 2025 sales of USD xx.xx and Engine Products aerospace revenues of USD xx.xx commercial and USD xx.xx defense establish the component-cohort scale; USD xx.xx gas-turbine revenue is excluded through an explicit attribution model. These are not material-market revenues. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The segment/end-market revenue table supplies the aerospace and gas-turbine boundaries needed to bridge combined spares activity into an aerospace replacement-material proxy. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial aerospace represented xx.xx% of 2025 company sales, supplying an independent downstream mix comparison rather than a nickel-material allocation weight. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense aerospace represented xx.xx% of 2025 company sales; the paired commercial/defense comparison tests the aviation model while retaining component and material-scope differences. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.

6. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: GE describes repaired/serviceable-part reuse, supporting a counterforce to converting aftermarket activity directly into newly supplied material purchases. Its reported approximately xx.xx% strategic-nickel revert content is not deducted from the terminal-material market. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Commercial repair and component reuse support retaining uncertainty around replacement-related combustion material purchases. The selected procurement-intensity offset remains an assumption, not a measured avoided-purchase percentage. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
7. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Canadian customer revenue constrains the conditional allocation calibration.
8. Special Metals - Tech Center
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised ingot supply establishes a PCC material-form crosswalk, not its sales weight.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised billet supply supports the forging-stock category mapping within the inherited PCC envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised bar supply supports classification only; the monetary coefficient is an assumption.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Plate, sheet and strip offerings support a distinct flat-product allocation premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire availability supports the material-form crosswalk without establishing revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Tubing availability supports the material-form crosswalk without establishing revenue.

9. DPC Holdings Limited - Registration Statement with 2025 Financial Statements
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing separates ingots from component sales and describes external supply and xx.xx% internal superalloy sourcing, contradicting the inherited xx.xx% captive parameter.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
10. Acerinox - Results FY 2025
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned US long-product expansion supports the relative conventional-long-material premise; investment is not recognized as sales.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately USD xx.xx of planned platform investment includes expansion of the long-products offering, informing the bars forecast premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace demand and planned long-product diversification support testing a relative mix shift without assuming flat-product contraction.
11. Haynes International - HAYNES 282
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Powder is offered alongside conventional forms for HAYNES xx.xx supporting nonexclusive form classification, not an observed sales allocation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))

12. CMA - Anticipated Acquisition of Haynes International by Acerinox: Full Text Decision
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct customer evidence in paragraphs xx.xx-xx.xx supports separate flat/long purchasing pools; no published market-share table is used.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Shape-specific purchasing supports a distinct long-stock allocation model without proving a separate competitive market for billet.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
13. Haynes International - HAYNES 230
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))

14. Carpenter Technology - Advanced Materials for Aerospace Motor & Engines

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation.
([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation.
([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))

15. Elementum 3D - Metal Alloy Additive Manufacturing Colorado

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed.
([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed.
([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))

16. NASA - NASA-Developed Printable Metal Can Take the Heat

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake.
([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake.
([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

17. Carpenter Technology - Lighter, Faster, Stronger Metallurgy for Defense, July 2025

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

18. Special Metals - Aerospace
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy xx.xx; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy X-xx.xx; no current sales quantity is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Waspaloy; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

19. Boeing - BDS Terms and Conditions Guide, D607 Material Substitution Prohibition, November 15, 2013
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: D607 prohibits unauthorized material substitutions while recognizing specified alternatives. It constrains assumptions about frictionless cross-class substitution, without quantifying adoption delays. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization requirements qualify assumptions about precipitation-family substitution opportunities; the clause does not prove future purchases or a class-growth premium. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause prohibits unauthorized substitutions where contractually applicable. It constrains the adoption interpretation but does not establish approval prevalence or a numerical adoption rate. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific material authorization is a counterweight to treating a named offering as immediately substitutable production material. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization limits interpretation of the assumed adoption multiplier; it does not directly establish powder sales. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))

20. Precision Castparts Corp. - Fiscal 2015 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
21. NASA - Chapter 2: Aerospace Materials Characteristics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

22. ESA - ESA Space Environment Report 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
23. NASA and Superalloys: A Customer, a Participant, and a Referee
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
24. VDM Metals - Alloys for the Aerospace Industry
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
25. Carpenter Technology - Business Segments
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))

26. Howmet Aerospace - 2025 Annual Report, Letter to Shareholders

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% combined aerospace and gas-turbine spares revenue constrains the distinction between initial-production and spare-component activity; material and destination adjustments remain modeled. ([howmet.com](https://www.howmet.com/annualreport/))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed combined spares proportion supplies the replacement proxy; approximately xx.xx% commercial aerospace engine-spares growth is historical counterevidence against assuming weak aftermarket activity. ([howmet.com](https://www.howmet.com/annualreport/))

27. GE Aerospace - 2025 Form 10-K

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment and services costs provide commercial budget anchors for the common material-value denominator; assumed eligible-material fractions prevent full equipment or service value from entering the allocation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Services include spare parts and maintenance activity, supporting an explicit new-article versus restoration attribution rather than equating services revenue with replacement-material purchases. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported USD xx.xx services cost anchors the restoration-material bridge; the restoration allocation and direct eligible-material fraction are assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Total funded R&D of USD xx.xx supplies a development-budget proxy, not observed nickel-material purchasing; only an assumed eligible-material fraction is used. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.

28. Rolls-Royce Holdings Plc - 2025 Full Year Results

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2028 shop-visit target is below the reported 2025 total despite prospective fleet growth, qualifying any automatic conversion of fleet expansion into proportionate maintenance-material purchasing.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The divergence between 2025 engine deliveries and shop visits independently challenges a uniform new-engine-led material forecast; no service revenue is included in the numerator.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Observed engine-delivery and shop-visit activity supports separate new-program and replacement-demand assumptions, not a proportional material-purchase conversion.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

29. UKRI - Accelerating Manufacturing Readiness level of ABD-1000AM for AM of high temperature aerospace components (AMRAM1000)
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The Alloyed-led project has xx.xx of funding and an April 2025-October 2026 funded period. This independently establishes bounded development activity, not annual material sales or recurring production purchases. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
30. Safran - FY 2025 Results and Investor Update, February 13, 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))

31. Airbus - Full-Year 2025 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 deliveries by aircraft family provide the starting activity comparison for the initial-production forecast; aircraft delivery value is not included in the material numerator. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx% decline in 2025 self-financed R&D is counterevidence to uniform development-budget acceleration and supports a restrained, explicitly assumed development-purchasing scenario. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.

32. Airbus - Half-Year 2026 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 update retained the A320-family, A350 and other production-rate targets, providing a dated commercial constraint on the initial-production activity scenario rather than proof of future material orders. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: First-half 2026 self-financed R&D of EUR xx.xx versus EUR xx.xx provides a modest-growth countercheck for the assumed development-project activity path; the budget is not material-market revenue. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))

33. RTX Corporation - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

34. Federal Reserve Bank of St. Louis - Annual USD/GBP Exchange Rate, AEXUSUK
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
35. L3Harris Technologies, Inc. - Fiscal 2025 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
36. FAA Aerospace Forecast Fiscal Years 2025-2045 - Commercial Space
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated official low/high scenarios provide FY2032 licensed launch/reentry activity bounds. Their U.S.-licensed scope and treatment of reusable vehicles prevent direct conversion into Global material revenue. ([faa.gov](https://www.faa.gov/data_research/aviation/aerospace_forecasts/2025-commercial-space.pdf))
37. ICAO - Convention on International Civil Aviation, Ninth Edition
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))

38. DFARS 252.225-7009 - Restriction on Acquisition of Certain Articles Containing Specialty Metals
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
39. Aubert & Duval - Space Industry Metallurgical Solutions
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
40. Aubert & Duval - Metallurgical Solutions for the Defense Industry, June 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
41. Berkshire Hathaway Inc. - 2025 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.

42. Lufthansa Group Annual Report 2025 - MRO business segment
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
43. Oliver Wyman - Global Fleet And MRO Market Forecast 2026-2036: Key Trends
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
44. German Aerospace Center (DLR) - Financing
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
45. Federal Aviation Administration - Parts Manufacturer Approval (PMA): Design Approval
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.

46. Rolled Alloys - E-Services Stocking Programs
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
47. Boeing BDS Terms and Conditions Guide - D604 Raw Material Risk Mitigation
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
48. Carpenter Technology Corporation - Second Quarter Fiscal 2026 Earnings Call Presentation, January 29, 2026
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation distinguishes specialized non-LTA business from a conventional spot market, countering automatic classification of transactional sales as stock.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Three additional aerospace LTAs and xx.xx% sequential commercial-aerospace bookings growth inform the reservation hypothesis, but do not measure its modeled magnitude.
49. Precision Castparts Corp. - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.

50. Howmet Aerospace - United States Locations
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
51. ATI Inc. - 2024 Annual Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New sales commitments through 2040, including amounts expected during the remainder of the decade and predominantly involving jet-engine nickel alloys, inform the direct-program forecast premise without being counted as realized sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% of fiscal-2024 plate volume went to independent service centers, providing a historical comparison that cautions against assuming generalized intermediary displacement.
52. Alloyed - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.

53. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 aerospace realization and revenue provide the common monetary calibration for this modeled grade; neither is a grade-specific sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace material realization supplies a price-scale input, with modeled year and product-mix adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization calibrates the assumed blended material price, not this grade's observed revenue. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace realization provides a shared monetary comparison for the assumed grade price. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported eight-to-ten-year aerospace application-introduction periods constrain interpretation of the seven-year adoption forecast. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace application-introduction periods provide an adoption-delay counterweight, not a forecast sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
54. European Commission CORDIS - Welding Metallurgy and Cracking in Superalloys: Reporting
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical all-sector tonnage discussion is only a dominance cross-check; it cannot establish current aerospace monetary share. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies 718Plus separately from ordinary xx.xx supporting identity separation without supplying a current sales weight. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
55. Special Metals - Alloy Surcharge Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: August-October 2026 grade surcharges provide a differentiated cost-exposure check, not full invoice prices or observed 2032 prices. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx surcharge sequence independently qualifies a uniform price assumption; it is not substituted for a material selling price. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The grade-specific surcharge listing is a commercial cost comparison, not an observed Global grade realization. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))

56. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current-and-past supplier identity mapping only; not proof of 2025 aerospace sales or the modeled volume. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: CMSX-xx.xx is separately identified; the material-value weight remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current sales are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713C is listed separately from IN-713LC; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713LC is listed separately from IN-713C; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx identity mapping only; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-738LC is separately identified; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current aerospace tonnes are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx appears in a current-and-past identification list; this does not establish recurring aerospace production sales. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: MAR-M xx.xx is identified separately from CM247LC; monetary weights remain modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PWA xx.xx is separately identified; no attributable sales value is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; current commercial scale remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; no current grade-specific material sales are disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Udimet xx.xx appears in the supplier's current-and-past identities; aerospace attribution is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

57. GE Aerospace - Safety First: A Retiring GE Aerospace Materials Engineer Made Protecting Lives His Mission
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
58. Aubert & Duval - AD730: Ni-Based Superalloy for High Temperature Applications
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
59. University of Portsmouth - Improved Creep-Fatigue-Oxidation Resistance in Gas Turbine Disc Materials: REF Impact Case Study
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))

60. Influence of Long Term Exposure in Air on Microstructure, Surface Stability and Mechanical Properties of UDIMET 720LI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The aerospace-industry publication distinguishes conventional Udimet xx.xx from its 720Li derivative; it does not establish a current monetary allocation. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The publication independently supports the 720Li identity and aircraft-engine-disc category, without supplying current sales. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))
61. NASA Contractor Report 174639 - Literature Survey on Oxidations and Fatigue Lives at Elevated Temperatures
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical institutional material identification is a legacy-category anchor only; it does not demonstrate current aerospace material sales. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
62. America Makes - 5566.002 Proliferation of Nickel Superalloy Material Datasets for Powder Bed Fusion Additive Manufacturing
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))
63. GE Aerospace - Fourth Quarter 2025 Earnings Presentation
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 commercial-engine delivery growth supplies a near-term demand cross-check, not a grade-specific purchasing or seven-year growth observation. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aggregate commercial and defense delivery growth constrains the commercial-demand scenario without establishing this grade's attributable consumption. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported defense-engine delivery growth is a demand-exposure check only; the PWA xx.xx activity factor remains assumed. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

18.11. India

Table 513. India Nickel-Based Superalloys for Aerospace Market Size, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
India	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 514. India Nickel-Based Superalloys for Aerospace Market Size, by Product Form, 2017-2040 (USD Million)

Product Form	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Bars, Rods and Profiles	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Billets and Forging Stock	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ingots	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Plate, Sheet, Strip and Foil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Powder	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Tubes and Pipes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Wire	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 515. India Nickel-Based Superalloys for Aerospace Market Size, by Strengthening Class, 2017-2040 (USD Million)

Strengthening Class	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Dispersion-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Precipitation-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Solid-Solution-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 516. India Nickel-Based Superalloys for Aerospace Market Size, by Component Application, 2017-2040 (USD Million)

Component Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Breathing Propulsion & Auxiliary Power	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Systems & Equipment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rocket & Spacecraft Propulsion	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Vehicle Structures & Thermal Protection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 517. India Nickel-Based Superalloys for Aerospace Market Size, by Air-Breathing Propulsion & Auxiliary Power, 2017-2040 (USD Million)

Air-Breathing Propulsion & Auxiliary Power	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combustion & Exhaust Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Compressor Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine Structures & Auxiliary Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Blades & Vanes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Disks & Rotor Hardware	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 518. India Nickel-Based Superalloys for Aerospace Market Size, by Demand Stage, 2017-2040 (USD Million)

Demand Stage	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Initial Equipment Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Repair, Overhaul & Refurbishment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Replacement & Retrofit Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research, Development & Qualification	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 519. India Nickel-Based Superalloys for Aerospace Market Size, by Aerospace End Market, 2017-2040 (USD Million)

Aerospace End Market	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Civil & Nonmilitary State Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Guided Missile Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Military Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Space Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 520. India Nickel-Based Superalloys for Aerospace Market Size, by Buyer Function, 2017-2040 (USD Million)

Buyer Function	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Aerospace Vehicle Manufacturers & Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Component & Subassembly Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine & Propulsion-System Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Maintenance, Repair & Overhaul Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Development Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 521. India Nickel-Based Superalloys for Aerospace Market Size, by Fulfillment Model, 2017-2040 (USD Million)

Fulfillment Model	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Order-Dedicated Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stock Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 522. India Nickel-Based Superalloys for Aerospace Market Size, by Supply Channel, 2017-2040 (USD Million)

Supply Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Captive Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent Intermediary Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Producer-Direct Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 523. India Nickel-Based Superalloys for Aerospace Market Size, by Alloy Grade, 2017-2040 (USD Million)

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ABD-1000AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
ABD-900AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 523 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
AD730	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy 718Plus	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy X-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CM247LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CMSX-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hastelloy X	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713C	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-738LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
MAR-M xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic 80A	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene 88DT	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 523 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
RR1000	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet 720Li	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Waspaloy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. ATI Inc. - 2025 Form 10-K

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC's reported financial/product-category inputs and listed ingot offering constrain the eligible material envelope; the ingot allocation remains assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: AA&S sales of USD xx.xx and its xx.xx% nickel-based/specialty-alloy category anchor the separately adjusted rolled-material envelope.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial jet-engine revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025, supporting purchasing recovery but not identifying price growth or a 2032 material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))

2. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
3. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Narrow-strip supply supports a limited flat-product allocation within the modeled eligible Carpenter envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire is a disclosed supplied form; its eligible monetary weight remains modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.

4. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical xx.xx% slab/bar/billet revenue category constrains the long-stock proxy; its eligible billet split is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported combined stock category provides a proxy anchor, not a separately disclosed bar revenue share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 flat products represented approximately xx.xx% of net product revenue; extrapolation to the eligible Acerinox envelope is modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 wire represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 tubulars represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical product revenue, channel mix and backlog conversion anchor the modeled stock value weight, with explicit scope adjustments.

5. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Casting-alloy activities support an ingot-material equivalent rather than attributing full engine-component revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed metal/billet activities support retaining a forging-stock allocation; the assumed xx.xx% weight is not reported.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported 2025 sales of USD xx.xx and Engine Products aerospace revenues of USD xx.xx commercial and USD xx.xx defense establish the component-cohort scale; USD xx.xx gas-turbine revenue is excluded through an explicit attribution model. These are not material-market revenues. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The segment/end-market revenue table supplies the aerospace and gas-turbine boundaries needed to bridge combined spares activity into an aerospace replacement-material proxy. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial aerospace represented xx.xx% of 2025 company sales, supplying an independent downstream mix comparison rather than a nickel-material allocation weight. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense aerospace represented xx.xx% of 2025 company sales; the paired commercial/defense comparison tests the aviation model while retaining component and material-scope differences. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.

6. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: GE describes repaired/serviceable-part reuse, supporting a counterforce to converting aftermarket activity directly into newly supplied material purchases. Its reported approximately xx.xx% strategic-nickel revert content is not deducted from the terminal-material market. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Commercial repair and component reuse support retaining uncertainty around replacement-related combustion material purchases. The selected procurement-intensity offset remains an assumption, not a measured avoided-purchase percentage. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
7. Special Metals - Tech Center
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised ingot supply establishes a PCC material-form crosswalk, not its sales weight.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised billet supply supports the forging-stock category mapping within the inherited PCC envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised bar supply supports classification only; the monetary coefficient is an assumption.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Plate, sheet and strip offerings support a distinct flat-product allocation premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire availability supports the material-form crosswalk without establishing revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Tubing availability supports the material-form crosswalk without establishing revenue.

8. DPC Holdings Limited - Registration Statement with 2025 Financial Statements
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing separates ingots from component sales and describes external supply and xx.xx% internal superalloy sourcing, contradicting the inherited xx.xx% captive parameter.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
9. Acerinox - Results FY 2025
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned US long-product expansion supports the relative conventional-long-material premise; investment is not recognized as sales.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately USD xx.xx of planned platform investment includes expansion of the long-products offering, informing the bars forecast premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace demand and planned long-product diversification support testing a relative mix shift without assuming flat-product contraction.
10. Haynes International - HAYNES 282
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Powder is offered alongside conventional forms for HAYNES xx.xx supporting nonexclusive form classification, not an observed sales allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))

11. CMA - Anticipated Acquisition of Haynes International by Acerinox: Full Text Decision
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct customer evidence in paragraphs xx.xx-xx.xx supports separate flat/long purchasing pools; no published market-share table is used.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Shape-specific purchasing supports a distinct long-stock allocation model without proving a separate competitive market for billet.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
12. Haynes International - HAYNES 230
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))

13. Carpenter Technology - Advanced Materials for Aerospace Motor & Engines

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation.
([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation.
([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))

14. Elementum 3D - Metal Alloy Additive Manufacturing Colorado

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed.
([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed.
([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))

15. NASA - NASA-Developed Printable Metal Can Take the Heat

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake.
([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake.
([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

16. Carpenter Technology - Lighter, Faster, Stronger Metallurgy for Defense, July 2025

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

17. Special Metals - Aerospace
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy xx.xx; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy X-xx.xx; no current sales quantity is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Waspaloy; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

18. Boeing - BDS Terms and Conditions Guide, D607 Material Substitution Prohibition, November 15, 2013
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: D607 prohibits unauthorized material substitutions while recognizing specified alternatives. It constrains assumptions about frictionless cross-class substitution, without quantifying adoption delays. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization requirements qualify assumptions about precipitation-family substitution opportunities; the clause does not prove future purchases or a class-growth premium. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause prohibits unauthorized substitutions where contractually applicable. It constrains the adoption interpretation but does not establish approval prevalence or a numerical adoption rate. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific material authorization is a counterweight to treating a named offering as immediately substitutable production material. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization limits interpretation of the assumed adoption multiplier; it does not directly establish powder sales. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))

19. Precision Castparts Corp. - Fiscal 2015 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
20. NASA - Chapter 2: Aerospace Materials Characteristics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

21. ESA - ESA Space Environment Report 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
22. NASA and Superalloys: A Customer, a Participant, and a Referee
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
23. VDM Metals - Alloys for the Aerospace Industry
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
24. Carpenter Technology - Business Segments
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))

25. Howmet Aerospace - 2025 Annual Report, Letter to Shareholders

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% combined aerospace and gas-turbine spares revenue constrains the distinction between initial-production and spare-component activity; material and destination adjustments remain modeled. ([howmet.com](https://www.howmet.com/annualreport/))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed combined spares proportion supplies the replacement proxy; approximately xx.xx% commercial aerospace engine-spares growth is historical counterevidence against assuming weak aftermarket activity. ([howmet.com](https://www.howmet.com/annualreport/))

26. GE Aerospace - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment and services costs provide commercial budget anchors for the common material-value denominator; assumed eligible-material fractions prevent full equipment or service value from entering the allocation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Services include spare parts and maintenance activity, supporting an explicit new-article versus restoration attribution rather than equating services revenue with replacement-material purchases. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported USD xx.xx services cost anchors the restoration-material bridge; the restoration allocation and direct eligible-material fraction are assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Total funded R&D of USD xx.xx supplies a development-budget proxy, not observed nickel-material purchasing; only an assumed eligible-material fraction is used. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.

27. Rolls-Royce Holdings Plc - 2025 Full Year Results

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2028 shop-visit target is below the reported 2025 total despite prospective fleet growth, qualifying any automatic conversion of fleet expansion into proportionate maintenance-material purchasing.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The divergence between 2025 engine deliveries and shop visits independently challenges a uniform new-engine-led material forecast; no service revenue is included in the numerator.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Observed engine-delivery and shop-visit activity supports separate new-program and replacement-demand assumptions, not a proportional material-purchase conversion.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

28. UKRI - Accelerating Manufacturing Readiness level of ABD-1000AM for AM of high temperature aerospace components (AMRAM1000)
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The Alloyed-led project has xx.xx of funding and an April 2025-October 2026 funded period. This independently establishes bounded development activity, not annual material sales or recurring production purchases. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
29. Safran - FY 2025 Results and Investor Update, February 13, 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))

30. Airbus - Full-Year 2025 Results

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 deliveries by aircraft family provide the starting activity comparison for the initial-production forecast; aircraft delivery value is not included in the material numerator. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx% decline in 2025 self-financed R&D is counterevidence to uniform development-budget acceleration and supports a restrained, explicitly assumed development-purchasing scenario. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.

31. Airbus - Half-Year 2026 Results

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 update retained the A320-family, A350 and other production-rate targets, providing a dated commercial constraint on the initial-production activity scenario rather than proof of future material orders. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: First-half 2026 self-financed R&D of EUR xx.xx versus EUR xx.xx provides a modest-growth countercheck for the assumed development-project activity path; the budget is not material-market revenue. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))

32. RTX Corporation - 2025 Form 10-K

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

33. Federal Reserve Bank of St. Louis - Annual USD/GBP Exchange Rate, AEXUSUK
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
34. L3Harris Technologies, Inc. - Fiscal 2025 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
35. FAA Aerospace Forecast Fiscal Years 2025-2045 - Commercial Space
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated official low/high scenarios provide FY2032 licensed launch/reentry activity bounds. Their U.S.-licensed scope and treatment of reusable vehicles prevent direct conversion into Global material revenue. ([faa.gov](https://www.faa.gov/data_research/aviation/aerospace_forecasts/2025-commercial-space.pdf))
36. ICAO - Convention on International Civil Aviation, Ninth Edition
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))

37. DFARS 252.225-7009 - Restriction on Acquisition of Certain Articles Containing Specialty Metals
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
38. Aubert & Duval - Space Industry Metallurgical Solutions
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
39. Aubert & Duval - Metallurgical Solutions for the Defense Industry, June 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
40. Berkshire Hathaway Inc. - 2025 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.

41. Lufthansa Group Annual Report 2025 - MRO business segment
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
42. Oliver Wyman - Global Fleet And MRO Market Forecast 2026-2036: Key Trends
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
43. German Aerospace Center (DLR) - Financing
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
44. Federal Aviation Administration - Parts Manufacturer Approval (PMA): Design Approval
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.

45. Rolled Alloys - E-Services Stocking Programs
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
46. Boeing BDS Terms and Conditions Guide - D604 Raw Material Risk Mitigation
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
47. Carpenter Technology Corporation - Second Quarter Fiscal 2026 Earnings Call Presentation, January 29, 2026
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation distinguishes specialized non-LTA business from a conventional spot market, countering automatic classification of transactional sales as stock.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Three additional aerospace LTAs and xx.xx% sequential commercial-aerospace bookings growth inform the reservation hypothesis, but do not measure its modeled magnitude.
48. Precision Castparts Corp. - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.

49. Howmet Aerospace - United States Locations
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.

50. ATI Inc. - 2024 Annual Report
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New sales commitments through 2040, including amounts expected during the remainder of the decade and predominantly involving jet-engine nickel alloys, inform the direct-program forecast premise without being counted as realized sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% of fiscal-2024 plate volume went to independent service centers, providing a historical comparison that cautions against assuming generalized intermediary displacement.

51. Alloyed - About
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.

52. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 aerospace realization and revenue provide the common monetary calibration for this modeled grade; neither is a grade-specific sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace material realization supplies a price-scale input, with modeled year and product-mix adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization calibrates the assumed blended material price, not this grade's observed revenue. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace realization provides a shared monetary comparison for the assumed grade price. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported eight-to-ten-year aerospace application-introduction periods constrain interpretation of the seven-year adoption forecast. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace application-introduction periods provide an adoption-delay counterweight, not a forecast sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
53. European Commission CORDIS - Welding Metallurgy and Cracking in Superalloys: Reporting
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical all-sector tonnage discussion is only a dominance cross-check; it cannot establish current aerospace monetary share. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies 718Plus separately from ordinary xx.xx supporting identity separation without supplying a current sales weight. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
54. Special Metals - Alloy Surcharge Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: August-October 2026 grade surcharges provide a differentiated cost-exposure check, not full invoice prices or observed 2032 prices. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx surcharge sequence independently qualifies a uniform price assumption; it is not substituted for a material selling price. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The grade-specific surcharge listing is a commercial cost comparison, not an observed Global grade realization. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))

55. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current-and-past supplier identity mapping only; not proof of 2025 aerospace sales or the modeled volume. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: CMSX-xx.xx is separately identified; the material-value weight remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current sales are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713C is listed separately from IN-713LC; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713LC is listed separately from IN-713C; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx identity mapping only; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-738LC is separately identified; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current aerospace tonnes are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx appears in a current-and-past identification list; this does not establish recurring aerospace production sales. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: MAR-M xx.xx is identified separately from CM247LC; monetary weights remain modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PWA xx.xx is separately identified; no attributable sales value is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; current commercial scale remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; no current grade-specific material sales are disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Udimet xx.xx appears in the supplier's current-and-past identities; aerospace attribution is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

56. GE Aerospace - Safety First: A Retiring GE Aerospace Materials Engineer Made Protecting Lives His Mission
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
57. Aubert & Duval - AD730: Ni-Based Superalloy for High Temperature Applications
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
58. University of Portsmouth - Improved Creep-Fatigue-Oxidation Resistance in Gas Turbine Disc Materials: REF Impact Case Study
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))

59. Influence of Long Term Exposure in Air on Microstructure, Surface Stability and Mechanical Properties of UDIMET 720LI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The aerospace-industry publication distinguishes conventional Udimet xx.xx from its 720Li derivative; it does not establish a current monetary allocation. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The publication independently supports the 720Li identity and aircraft-engine-disc category, without supplying current sales. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

60. NASA Contractor Report 174639 - Literature Survey on Oxidations and Fatigue Lives at Elevated Temperatures

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical institutional material identification is a legacy-category anchor only; it does not demonstrate current aerospace material sales. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

61. America Makes - 5566.002 Proliferation of Nickel Superalloy Material Datasets for Powder Bed Fusion Additive Manufacturing

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))

62. GE Aerospace - Fourth Quarter 2025 Earnings Presentation

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 commercial-engine delivery growth supplies a near-term demand cross-check, not a grade-specific purchasing or seven-year growth observation. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aggregate commercial and defense delivery growth constrains the commercial-demand scenario without establishing this grade's attributable consumption. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported defense-engine delivery growth is a demand-exposure check only; the PWA xx.xx activity factor remains assumed. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

18.12. South Korea

Table 524. South Korea Nickel-Based Superalloys for Aerospace Market Size, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
South Korea	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 525. South Korea Nickel-Based Superalloys for Aerospace Market Size, by Product Form, 2017-2040 (USD Million)

Product Form	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Bars, Rods and Profiles	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Billets and Forging Stock	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ingots	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Plate, Sheet, Strip and Foil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Powder	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Tubes and Pipes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Wire	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 526. South Korea Nickel-Based Superalloys for Aerospace Market Size, by Strengthening Class, 2017-2040 (USD Million)

Strengthening Class	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Dispersion-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Precipitation-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Solid-Solution-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 527. South Korea Nickel-Based Superalloys for Aerospace Market Size, by Component Application, 2017-2040 (USD Million)

Component Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Breathing Propulsion & Auxiliary Power	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Systems & Equipment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rocket & Spacecraft Propulsion	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Vehicle Structures & Thermal Protection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 528. South Korea Nickel-Based Superalloys for Aerospace Market Size, by Air-Breathing Propulsion & Auxiliary Power, 2017-2040 (USD Million)

Air-Breathing Propulsion & Auxiliary Power	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combustion & Exhaust Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Compressor Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine Structures & Auxiliary Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Blades & Vanes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Disks & Rotor Hardware	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 529. South Korea Nickel-Based Superalloys for Aerospace Market Size, by Demand Stage, 2017-2040 (USD Million)

Demand Stage	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Initial Equipment Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Repair, Overhaul & Refurbishment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Replacement & Retrofit Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research, Development & Qualification	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 530. South Korea Nickel-Based Superalloys for Aerospace Market Size, by Aerospace End Market, 2017-2040 (USD Million)

Aerospace End Market	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Civil & Nonmilitary State Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Guided Missile Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Military Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Space Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 531. South Korea Nickel-Based Superalloys for Aerospace Market Size, by Buyer Function, 2017-2040 (USD Million)

Buyer Function	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Aerospace Vehicle Manufacturers & Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Component & Subassembly Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine & Propulsion-System Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Maintenance, Repair & Overhaul Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Development Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 532. South Korea Nickel-Based Superalloys for Aerospace Market Size, by Fulfillment Model, 2017-2040 (USD Million)

Fulfillment Model	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Order-Dedicated Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stock Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 533. South Korea Nickel-Based Superalloys for Aerospace Market Size, by Supply Channel, 2017-2040 (USD Million)

Supply Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Captive Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent Intermediary Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Producer-Direct Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 534. South Korea Nickel-Based Superalloys for Aerospace Market Size, by Alloy Grade, 2017-2040 (USD Million)

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ABD-1000AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
ABD-900AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 534 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
AD730	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy 718Plus	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy X-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CM247LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CMSX-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hastelloy X	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713C	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-738LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
MAR-M xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic 80A	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene 88DT	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 534 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
RR1000	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet 720Li	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Waspaloy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. ATI Inc. - 2025 Form 10-K

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC's reported financial/product-category inputs and listed ingot offering constrain the eligible material envelope; the ingot allocation remains assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: AA&S sales of USD xx.xx and its xx.xx% nickel-based/specialty-alloy category anchor the separately adjusted rolled-material envelope.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial jet-engine revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025, supporting purchasing recovery but not identifying price growth or a 2032 material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))

2. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
3. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Narrow-strip supply supports a limited flat-product allocation within the modeled eligible Carpenter envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire is a disclosed supplied form; its eligible monetary weight remains modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.

4. Haynes International, Inc. - 2023 Form 10-K

- Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
- Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
- Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
- Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
- Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical xx.xx% slab/bar/billet revenue category constrains the long-stock proxy; its eligible billet split is assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported combined stock category provides a proxy anchor, not a separately disclosed bar revenue share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 flat products represented approximately xx.xx% of net product revenue; extrapolation to the eligible Acerinox envelope is modeled.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 wire represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 tubulars represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical product revenue, channel mix and backlog conversion anchor the modeled stock value weight, with explicit scope adjustments.

5. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Casting-alloy activities support an ingot-material equivalent rather than attributing full engine-component revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed metal/billet activities support retaining a forging-stock allocation; the assumed xx.xx% weight is not reported.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported 2025 sales of USD xx.xx and Engine Products aerospace revenues of USD xx.xx commercial and USD xx.xx defense establish the component-cohort scale; USD xx.xx gas-turbine revenue is excluded through an explicit attribution model. These are not material-market revenues. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The segment/end-market revenue table supplies the aerospace and gas-turbine boundaries needed to bridge combined spares activity into an aerospace replacement-material proxy. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial aerospace represented xx.xx% of 2025 company sales, supplying an independent downstream mix comparison rather than a nickel-material allocation weight. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense aerospace represented xx.xx% of 2025 company sales; the paired commercial/defense comparison tests the aviation model while retaining component and material-scope differences. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.

6. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: GE describes repaired/serviceable-part reuse, supporting a counterforce to converting aftermarket activity directly into newly supplied material purchases. Its reported approximately xx.xx% strategic-nickel revert content is not deducted from the terminal-material market. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Commercial repair and component reuse support retaining uncertainty around replacement-related combustion material purchases. The selected procurement-intensity offset remains an assumption, not a measured avoided-purchase percentage. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
7. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Korean flat-product input.
8. Special Metals - Tech Center
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised ingot supply establishes a PCC material-form crosswalk, not its sales weight.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised billet supply supports the forging-stock category mapping within the inherited PCC envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised bar supply supports classification only; the monetary coefficient is an assumption.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Plate, sheet and strip offerings support a distinct flat-product allocation premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire availability supports the material-form crosswalk without establishing revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Tubing availability supports the material-form crosswalk without establishing revenue.

9. DPC Holdings Limited - Registration Statement with 2025 Financial Statements
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing separates ingots from component sales and describes external supply and xx.xx% internal superalloy sourcing, contradicting the inherited xx.xx% captive parameter.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
10. Acerinox - Results FY 2025
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned US long-product expansion supports the relative conventional-long-material premise; investment is not recognized as sales.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately USD xx.xx of planned platform investment includes expansion of the long-products offering, informing the bars forecast premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace demand and planned long-product diversification support testing a relative mix shift without assuming flat-product contraction.
11. Haynes International - HAYNES 282
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Powder is offered alongside conventional forms for HAYNES xx.xx supporting nonexclusive form classification, not an observed sales allocation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))

12. CMA - Anticipated Acquisition of Haynes International by Acerinox: Full Text Decision
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct customer evidence in paragraphs xx.xx-xx.xx supports separate flat/long purchasing pools; no published market-share table is used.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Shape-specific purchasing supports a distinct long-stock allocation model without proving a separate competitive market for billet.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
13. Haynes International - HAYNES 230
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))

14. Carpenter Technology - Advanced Materials for Aerospace Motor & Engines

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation.
([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation.
([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))

15. Elementum 3D - Metal Alloy Additive Manufacturing Colorado

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed.
([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed.
([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))

16. NASA - NASA-Developed Printable Metal Can Take the Heat

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake.
([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake.
([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

17. Carpenter Technology - Lighter, Faster, Stronger Metallurgy for Defense, July 2025

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

18. Special Metals - Aerospace
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy xx.xx; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy X-xx.xx; no current sales quantity is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Waspaloy; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

19. Boeing - BDS Terms and Conditions Guide, D607 Material Substitution Prohibition, November 15, 2013
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: D607 prohibits unauthorized material substitutions while recognizing specified alternatives. It constrains assumptions about frictionless cross-class substitution, without quantifying adoption delays. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization requirements qualify assumptions about precipitation-family substitution opportunities; the clause does not prove future purchases or a class-growth premium. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause prohibits unauthorized substitutions where contractually applicable. It constrains the adoption interpretation but does not establish approval prevalence or a numerical adoption rate. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific material authorization is a counterweight to treating a named offering as immediately substitutable production material. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization limits interpretation of the assumed adoption multiplier; it does not directly establish powder sales. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))

20. Precision Castparts Corp. - Fiscal 2015 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
21. NASA - Chapter 2: Aerospace Materials Characteristics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

22. ESA - ESA Space Environment Report 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
23. NASA and Superalloys: A Customer, a Participant, and a Referee
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
24. VDM Metals - Alloys for the Aerospace Industry
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
25. Carpenter Technology - Business Segments
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))

26. Howmet Aerospace - 2025 Annual Report, Letter to Shareholders

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% combined aerospace and gas-turbine spares revenue constrains the distinction between initial-production and spare-component activity; material and destination adjustments remain modeled. ([howmet.com](https://www.howmet.com/annualreport/))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed combined spares proportion supplies the replacement proxy; approximately xx.xx% commercial aerospace engine-spares growth is historical counterevidence against assuming weak aftermarket activity. ([howmet.com](https://www.howmet.com/annualreport/))

27. GE Aerospace - 2025 Form 10-K

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment and services costs provide commercial budget anchors for the common material-value denominator; assumed eligible-material fractions prevent full equipment or service value from entering the allocation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Services include spare parts and maintenance activity, supporting an explicit new-article versus restoration attribution rather than equating services revenue with replacement-material purchases. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported USD xx.xx services cost anchors the restoration-material bridge; the restoration allocation and direct eligible-material fraction are assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Total funded R&D of USD xx.xx supplies a development-budget proxy, not observed nickel-material purchasing; only an assumed eligible-material fraction is used. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.

28. Rolls-Royce Holdings Plc - 2025 Full Year Results

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2028 shop-visit target is below the reported 2025 total despite prospective fleet growth, qualifying any automatic conversion of fleet expansion into proportionate maintenance-material purchasing.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The divergence between 2025 engine deliveries and shop visits independently challenges a uniform new-engine-led material forecast; no service revenue is included in the numerator.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Observed engine-delivery and shop-visit activity supports separate new-program and replacement-demand assumptions, not a proportional material-purchase conversion.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

29. UKRI - Accelerating Manufacturing Readiness level of ABD-1000AM for AM of high temperature aerospace components (AMRAM1000)
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The Alloyed-led project has xx.xx of funding and an April 2025-October 2026 funded period. This independently establishes bounded development activity, not annual material sales or recurring production purchases. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
30. Safran - FY 2025 Results and Investor Update, February 13, 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))

31. Airbus - Full-Year 2025 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 deliveries by aircraft family provide the starting activity comparison for the initial-production forecast; aircraft delivery value is not included in the material numerator. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx% decline in 2025 self-financed R&D is counterevidence to uniform development-budget acceleration and supports a restrained, explicitly assumed development-purchasing scenario. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.

32. Airbus - Half-Year 2026 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 update retained the A320-family, A350 and other production-rate targets, providing a dated commercial constraint on the initial-production activity scenario rather than proof of future material orders. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: First-half 2026 self-financed R&D of EUR xx.xx versus EUR xx.xx provides a modest-growth countercheck for the assumed development-project activity path; the budget is not material-market revenue. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))

33. RTX Corporation - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

34. Federal Reserve Bank of St. Louis - Annual USD/GBP Exchange Rate, AEXUSUK
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
35. L3Harris Technologies, Inc. - Fiscal 2025 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
36. FAA Aerospace Forecast Fiscal Years 2025-2045 - Commercial Space
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated official low/high scenarios provide FY2032 licensed launch/reentry activity bounds. Their U.S.-licensed scope and treatment of reusable vehicles prevent direct conversion into Global material revenue. ([faa.gov](https://www.faa.gov/data_research/aviation/aerospace_forecasts/2025-commercial-space.pdf))
37. ICAO - Convention on International Civil Aviation, Ninth Edition
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))

38. DFARS 252.225-7009 - Restriction on Acquisition of Certain Articles Containing Specialty Metals
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
39. Aubert & Duval - Space Industry Metallurgical Solutions
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
40. Aubert & Duval - Metallurgical Solutions for the Defense Industry, June 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
41. Berkshire Hathaway Inc. - 2025 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.

42. Lufthansa Group Annual Report 2025 - MRO business segment
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
43. Oliver Wyman - Global Fleet And MRO Market Forecast 2026-2036: Key Trends
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
44. German Aerospace Center (DLR) - Financing
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
45. Federal Aviation Administration - Parts Manufacturer Approval (PMA): Design Approval
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.

46. Rolled Alloys - E-Services Stocking Programs
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
47. Boeing BDS Terms and Conditions Guide - D604 Raw Material Risk Mitigation
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
48. Carpenter Technology Corporation - Second Quarter Fiscal 2026 Earnings Call Presentation, January 29, 2026
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation distinguishes specialized non-LTA business from a conventional spot market, countering automatic classification of transactional sales as stock.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Three additional aerospace LTAs and xx.xx% sequential commercial-aerospace bookings growth inform the reservation hypothesis, but do not measure its modeled magnitude.
49. Precision Castparts Corp. - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.

50. Howmet Aerospace - United States Locations
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
51. ATI Inc. - 2024 Annual Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New sales commitments through 2040, including amounts expected during the remainder of the decade and predominantly involving jet-engine nickel alloys, inform the direct-program forecast premise without being counted as realized sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% of fiscal-2024 plate volume went to independent service centers, providing a historical comparison that cautions against assuming generalized intermediary displacement.
52. Alloyed - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.

53. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 aerospace realization and revenue provide the common monetary calibration for this modeled grade; neither is a grade-specific sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace material realization supplies a price-scale input, with modeled year and product-mix adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization calibrates the assumed blended material price, not this grade's observed revenue. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace realization provides a shared monetary comparison for the assumed grade price. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported eight-to-ten-year aerospace application-introduction periods constrain interpretation of the seven-year adoption forecast. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace application-introduction periods provide an adoption-delay counterweight, not a forecast sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
54. European Commission CORDIS - Welding Metallurgy and Cracking in Superalloys: Reporting
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical all-sector tonnage discussion is only a dominance cross-check; it cannot establish current aerospace monetary share. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies 718Plus separately from ordinary xx.xx supporting identity separation without supplying a current sales weight. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
55. Special Metals - Alloy Surcharge Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: August-October 2026 grade surcharges provide a differentiated cost-exposure check, not full invoice prices or observed 2032 prices. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx surcharge sequence independently qualifies a uniform price assumption; it is not substituted for a material selling price. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The grade-specific surcharge listing is a commercial cost comparison, not an observed Global grade realization. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))

56. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current-and-past supplier identity mapping only; not proof of 2025 aerospace sales or the modeled volume. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: CMSX-xx.xx is separately identified; the material-value weight remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current sales are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713C is listed separately from IN-713LC; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713LC is listed separately from IN-713C; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx identity mapping only; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-738LC is separately identified; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current aerospace tonnes are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx appears in a current-and-past identification list; this does not establish recurring aerospace production sales. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: MAR-M xx.xx is identified separately from CM247LC; monetary weights remain modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PWA xx.xx is separately identified; no attributable sales value is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; current commercial scale remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; no current grade-specific material sales are disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Udimet xx.xx appears in the supplier's current-and-past identities; aerospace attribution is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

57. GE Aerospace - Safety First: A Retiring GE Aerospace Materials Engineer Made Protecting Lives His Mission
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
58. Aubert & Duval - AD730: Ni-Based Superalloy for High Temperature Applications
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
59. University of Portsmouth - Improved Creep-Fatigue-Oxidation Resistance in Gas Turbine Disc Materials: REF Impact Case Study
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))

60. Influence of Long Term Exposure in Air on Microstructure, Surface Stability and Mechanical Properties of UDIMET 720LI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The aerospace-industry publication distinguishes conventional Udimet xx.xx from its 720Li derivative; it does not establish a current monetary allocation. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The publication independently supports the 720Li identity and aircraft-engine-disc category, without supplying current sales. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))
61. NASA Contractor Report 174639 - Literature Survey on Oxidations and Fatigue Lives at Elevated Temperatures
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical institutional material identification is a legacy-category anchor only; it does not demonstrate current aerospace material sales. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
62. America Makes - 5566.002 Proliferation of Nickel Superalloy Material Datasets for Powder Bed Fusion Additive Manufacturing
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))
63. GE Aerospace - Fourth Quarter 2025 Earnings Presentation
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 commercial-engine delivery growth supplies a near-term demand cross-check, not a grade-specific purchasing or seven-year growth observation. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aggregate commercial and defense delivery growth constrains the commercial-demand scenario without establishing this grade's attributable consumption. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported defense-engine delivery growth is a demand-exposure check only; the PWA xx.xx activity factor remains assumed. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

18.13. Spain

Table 535. Spain Nickel-Based Superalloys for Aerospace Market Size, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Spain	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 536. Spain Nickel-Based Superalloys for Aerospace Market Size, by Product Form, 2017-2040 (USD Million)

Product Form	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Bars, Rods and Profiles	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Billets and Forging Stock	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ingots	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Plate, Sheet, Strip and Foil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Powder	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Tubes and Pipes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Wire	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 537. Spain Nickel-Based Superalloys for Aerospace Market Size, by Strengthening Class, 2017-2040 (USD Million)

Strengthening Class	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Dispersion-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Precipitation-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Solid-Solution-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 538. Spain Nickel-Based Superalloys for Aerospace Market Size, by Component Application, 2017-2040 (USD Million)

Component Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Breathing Propulsion & Auxiliary Power	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Systems & Equipment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rocket & Spacecraft Propulsion	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Vehicle Structures & Thermal Protection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 539. Spain Nickel-Based Superalloys for Aerospace Market Size, by Air-Breathing Propulsion & Auxiliary Power, 2017-2040 (USD Million)

Air-Breathing Propulsion & Auxiliary Power	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combustion & Exhaust Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Compressor Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine Structures & Auxiliary Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Blades & Vanes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Disks & Rotor Hardware	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 540. Spain Nickel-Based Superalloys for Aerospace Market Size, by Demand Stage, 2017-2040 (USD Million)

Demand Stage	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Initial Equipment Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Repair, Overhaul & Refurbishment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Replacement & Retrofit Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research, Development & Qualification	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 541. Spain Nickel-Based Superalloys for Aerospace Market Size, by Aerospace End Market, 2017-2040 (USD Million)

Aerospace End Market	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Civil & Nonmilitary State Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Guided Missile Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Military Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Space Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 542. Spain Nickel-Based Superalloys for Aerospace Market Size, by Buyer Function, 2017-2040 (USD Million)

Buyer Function	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Aerospace Vehicle Manufacturers & Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Component & Subassembly Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine & Propulsion-System Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Maintenance, Repair & Overhaul Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Development Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 543. Spain Nickel-Based Superalloys for Aerospace Market Size, by Fulfillment Model, 2017-2040 (USD Million)

Fulfillment Model	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Order-Dedicated Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stock Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 544. Spain Nickel-Based Superalloys for Aerospace Market Size, by Supply Channel, 2017-2040 (USD Million)

Supply Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Captive Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent Intermediary Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Producer-Direct Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 545. Spain Nickel-Based Superalloys for Aerospace Market Size, by Alloy Grade, 2017-2040 (USD Million)

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ABD-1000AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
ABD-900AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 545 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
AD730	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy 718Plus	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy X-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CM247LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CMSX-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hastelloy X	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713C	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-738LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
MAR-M xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic 80A	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene 88DT	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 545 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
RR1000	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet 720Li	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Waspaloy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. ATI Inc. - 2025 Form 10-K

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC's reported financial/product-category inputs and listed ingot offering constrain the eligible material envelope; the ingot allocation remains assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: AA&S sales of USD xx.xx and its xx.xx% nickel-based/specialty-alloy category anchor the separately adjusted rolled-material envelope.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial jet-engine revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025, supporting purchasing recovery but not identifying price growth or a 2032 material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))

2. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
3. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Narrow-strip supply supports a limited flat-product allocation within the modeled eligible Carpenter envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire is a disclosed supplied form; its eligible monetary weight remains modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.

4. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical xx.xx% slab/bar/billet revenue category constrains the long-stock proxy; its eligible billet split is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported combined stock category provides a proxy anchor, not a separately disclosed bar revenue share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 flat products represented approximately xx.xx% of net product revenue; extrapolation to the eligible Acerinox envelope is modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 wire represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 tubulars represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical product revenue, channel mix and backlog conversion anchor the modeled stock value weight, with explicit scope adjustments.

5. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Casting-alloy activities support an ingot-material equivalent rather than attributing full engine-component revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed metal/billet activities support retaining a forging-stock allocation; the assumed xx.xx% weight is not reported.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported 2025 sales of USD xx.xx and Engine Products aerospace revenues of USD xx.xx commercial and USD xx.xx defense establish the component-cohort scale; USD xx.xx gas-turbine revenue is excluded through an explicit attribution model. These are not material-market revenues. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The segment/end-market revenue table supplies the aerospace and gas-turbine boundaries needed to bridge combined spares activity into an aerospace replacement-material proxy. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial aerospace represented xx.xx% of 2025 company sales, supplying an independent downstream mix comparison rather than a nickel-material allocation weight. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense aerospace represented xx.xx% of 2025 company sales; the paired commercial/defense comparison tests the aviation model while retaining component and material-scope differences. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.

6. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: GE describes repaired/serviceable-part reuse, supporting a counterforce to converting aftermarket activity directly into newly supplied material purchases. Its reported approximately xx.xx% strategic-nickel revert content is not deducted from the terminal-material market. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Commercial repair and component reuse support retaining uncertainty around replacement-related combustion material purchases. The selected procurement-intensity offset remains an assumption, not a measured avoided-purchase percentage. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
7. Special Metals - Tech Center
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised ingot supply establishes a PCC material-form crosswalk, not its sales weight.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised billet supply supports the forging-stock category mapping within the inherited PCC envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised bar supply supports classification only; the monetary coefficient is an assumption.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Plate, sheet and strip offerings support a distinct flat-product allocation premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire availability supports the material-form crosswalk without establishing revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Tubing availability supports the material-form crosswalk without establishing revenue.

8. DPC Holdings Limited - Registration Statement with 2025 Financial Statements
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing separates ingots from component sales and describes external supply and xx.xx% internal superalloy sourcing, contradicting the inherited xx.xx% captive parameter.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
9. Acerinox - Results FY 2025
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned US long-product expansion supports the relative conventional-long-material premise; investment is not recognized as sales.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately USD xx.xx of planned platform investment includes expansion of the long-products offering, informing the bars forecast premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace demand and planned long-product diversification support testing a relative mix shift without assuming flat-product contraction.
10. Haynes International - HAYNES 282
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Powder is offered alongside conventional forms for HAYNES xx.xx supporting nonexclusive form classification, not an observed sales allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))

11. CMA - Anticipated Acquisition of Haynes International by Acerinox: Full Text Decision
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct customer evidence in paragraphs xx.xx-xx.xx supports separate flat/long purchasing pools; no published market-share table is used.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Shape-specific purchasing supports a distinct long-stock allocation model without proving a separate competitive market for billet.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
12. Haynes International - HAYNES 230
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))

13. Carpenter Technology - Advanced Materials for Aerospace Motor & Engines

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation.
([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation.
([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))

14. Elementum 3D - Metal Alloy Additive Manufacturing Colorado

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed.
([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed.
([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))

15. NASA - NASA-Developed Printable Metal Can Take the Heat

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake.
([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake.
([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

16. Carpenter Technology - Lighter, Faster, Stronger Metallurgy for Defense, July 2025

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

17. Special Metals - Aerospace
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy xx.xx; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy X-xx.xx; no current sales quantity is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Waspaloy; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

18. Boeing - BDS Terms and Conditions Guide, D607 Material Substitution Prohibition, November 15, 2013
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: D607 prohibits unauthorized material substitutions while recognizing specified alternatives. It constrains assumptions about frictionless cross-class substitution, without quantifying adoption delays. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization requirements qualify assumptions about precipitation-family substitution opportunities; the clause does not prove future purchases or a class-growth premium. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause prohibits unauthorized substitutions where contractually applicable. It constrains the adoption interpretation but does not establish approval prevalence or a numerical adoption rate. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific material authorization is a counterweight to treating a named offering as immediately substitutable production material. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization limits interpretation of the assumed adoption multiplier; it does not directly establish powder sales. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))

19. Precision Castparts Corp. - Fiscal 2015 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.

20. NASA - Chapter 2: Aerospace Materials Characteristics

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

21. ESA - ESA Space Environment Report 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
22. NASA and Superalloys: A Customer, a Participant, and a Referee
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
23. VDM Metals - Alloys for the Aerospace Industry
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
24. Carpenter Technology - Business Segments
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))

25. Howmet Aerospace - 2025 Annual Report, Letter to Shareholders

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% combined aerospace and gas-turbine spares revenue constrains the distinction between initial-production and spare-component activity; material and destination adjustments remain modeled. ([howmet.com](https://www.howmet.com/annualreport/))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed combined spares proportion supplies the replacement proxy; approximately xx.xx% commercial aerospace engine-spares growth is historical counterevidence against assuming weak aftermarket activity. ([howmet.com](https://www.howmet.com/annualreport/))

26. GE Aerospace - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment and services costs provide commercial budget anchors for the common material-value denominator; assumed eligible-material fractions prevent full equipment or service value from entering the allocation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Services include spare parts and maintenance activity, supporting an explicit new-article versus restoration attribution rather than equating services revenue with replacement-material purchases. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported USD xx.xx services cost anchors the restoration-material bridge; the restoration allocation and direct eligible-material fraction are assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Total funded R&D of USD xx.xx supplies a development-budget proxy, not observed nickel-material purchasing; only an assumed eligible-material fraction is used. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.

27. Rolls-Royce Holdings Plc - 2025 Full Year Results

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2028 shop-visit target is below the reported 2025 total despite prospective fleet growth, qualifying any automatic conversion of fleet expansion into proportionate maintenance-material purchasing.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The divergence between 2025 engine deliveries and shop visits independently challenges a uniform new-engine-led material forecast; no service revenue is included in the numerator.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Observed engine-delivery and shop-visit activity supports separate new-program and replacement-demand assumptions, not a proportional material-purchase conversion.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

28. UKRI - Accelerating Manufacturing Readiness level of ABD-1000AM for AM of high temperature aerospace components (AMRAM1000)
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The Alloyed-led project has xx.xx of funding and an April 2025-October 2026 funded period. This independently establishes bounded development activity, not annual material sales or recurring production purchases. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
29. Safran - FY 2025 Results and Investor Update, February 13, 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))

30. Airbus - Full-Year 2025 Results

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 deliveries by aircraft family provide the starting activity comparison for the initial-production forecast; aircraft delivery value is not included in the material numerator. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx% decline in 2025 self-financed R&D is counterevidence to uniform development-budget acceleration and supports a restrained, explicitly assumed development-purchasing scenario. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.

31. Airbus - Half-Year 2026 Results

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 update retained the A320-family, A350 and other production-rate targets, providing a dated commercial constraint on the initial-production activity scenario rather than proof of future material orders. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: First-half 2026 self-financed R&D of EUR xx.xx versus EUR xx.xx provides a modest-growth countercheck for the assumed development-project activity path; the budget is not material-market revenue. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))

32. RTX Corporation - 2025 Form 10-K

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

33. Federal Reserve Bank of St. Louis - Annual USD/GBP Exchange Rate, AEXUSUK
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
34. L3Harris Technologies, Inc. - Fiscal 2025 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
35. FAA Aerospace Forecast Fiscal Years 2025-2045 - Commercial Space
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated official low/high scenarios provide FY2032 licensed launch/reentry activity bounds. Their U.S.-licensed scope and treatment of reusable vehicles prevent direct conversion into Global material revenue. ([faa.gov](https://www.faa.gov/data_research/aviation/aerospace_forecasts/2025-commercial-space.pdf))
36. ICAO - Convention on International Civil Aviation, Ninth Edition
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))

37. DFARS 252.225-7009 - Restriction on Acquisition of Certain Articles Containing Specialty Metals
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
38. Aubert & Duval - Space Industry Metallurgical Solutions
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
39. Aubert & Duval - Metallurgical Solutions for the Defense Industry, June 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
40. Berkshire Hathaway Inc. - 2025 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.

41. Lufthansa Group Annual Report 2025 - MRO business segment
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
42. Oliver Wyman - Global Fleet And MRO Market Forecast 2026-2036: Key Trends
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
43. German Aerospace Center (DLR) - Financing
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
44. Federal Aviation Administration - Parts Manufacturer Approval (PMA): Design Approval
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.

45. Rolled Alloys - E-Services Stocking Programs
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
46. Boeing BDS Terms and Conditions Guide - D604 Raw Material Risk Mitigation
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
47. Carpenter Technology Corporation - Second Quarter Fiscal 2026 Earnings Call Presentation, January 29, 2026
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation distinguishes specialized non-LTA business from a conventional spot market, countering automatic classification of transactional sales as stock.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Three additional aerospace LTAs and xx.xx% sequential commercial-aerospace bookings growth inform the reservation hypothesis, but do not measure its modeled magnitude.
48. Precision Castparts Corp. - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.

49. Howmet Aerospace - United States Locations
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
50. ATI Inc. - 2024 Annual Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New sales commitments through 2040, including amounts expected during the remainder of the decade and predominantly involving jet-engine nickel alloys, inform the direct-program forecast premise without being counted as realized sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% of fiscal-2024 plate volume went to independent service centers, providing a historical comparison that cautions against assuming generalized intermediary displacement.
51. Alloyed - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.

52. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 aerospace realization and revenue provide the common monetary calibration for this modeled grade; neither is a grade-specific sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace material realization supplies a price-scale input, with modeled year and product-mix adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization calibrates the assumed blended material price, not this grade's observed revenue. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace realization provides a shared monetary comparison for the assumed grade price. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported eight-to-ten-year aerospace application-introduction periods constrain interpretation of the seven-year adoption forecast. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace application-introduction periods provide an adoption-delay counterweight, not a forecast sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
53. European Commission CORDIS - Welding Metallurgy and Cracking in Superalloys: Reporting
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical all-sector tonnage discussion is only a dominance cross-check; it cannot establish current aerospace monetary share. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies 718Plus separately from ordinary xx.xx supporting identity separation without supplying a current sales weight. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
54. Special Metals - Alloy Surcharge Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: August-October 2026 grade surcharges provide a differentiated cost-exposure check, not full invoice prices or observed 2032 prices. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx surcharge sequence independently qualifies a uniform price assumption; it is not substituted for a material selling price. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The grade-specific surcharge listing is a commercial cost comparison, not an observed Global grade realization. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))

55. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current-and-past supplier identity mapping only; not proof of 2025 aerospace sales or the modeled volume. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: CMSX-xx.xx is separately identified; the material-value weight remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current sales are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713C is listed separately from IN-713LC; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713LC is listed separately from IN-713C; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx identity mapping only; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-738LC is separately identified; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current aerospace tonnes are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx appears in a current-and-past identification list; this does not establish recurring aerospace production sales. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: MAR-M xx.xx is identified separately from CM247LC; monetary weights remain modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PWA xx.xx is separately identified; no attributable sales value is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; current commercial scale remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; no current grade-specific material sales are disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Udimet xx.xx appears in the supplier's current-and-past identities; aerospace attribution is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

56. GE Aerospace - Safety First: A Retiring GE Aerospace Materials Engineer Made Protecting Lives His Mission
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
57. Aubert & Duval - AD730: Ni-Based Superalloy for High Temperature Applications
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
58. University of Portsmouth - Improved Creep-Fatigue-Oxidation Resistance in Gas Turbine Disc Materials: REF Impact Case Study
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))

59. Influence of Long Term Exposure in Air on Microstructure, Surface Stability and Mechanical Properties of UDIMET 720LI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The aerospace-industry publication distinguishes conventional Udimet xx.xx from its 720Li derivative; it does not establish a current monetary allocation. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The publication independently supports the 720Li identity and aircraft-engine-disc category, without supplying current sales. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

60. NASA Contractor Report 174639 - Literature Survey on Oxidations and Fatigue Lives at Elevated Temperatures

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical institutional material identification is a legacy-category anchor only; it does not demonstrate current aerospace material sales. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

61. America Makes - 5566.002 Proliferation of Nickel Superalloy Material Datasets for Powder Bed Fusion Additive Manufacturing

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))

62. GE Aerospace - Fourth Quarter 2025 Earnings Presentation

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 commercial-engine delivery growth supplies a near-term demand cross-check, not a grade-specific purchasing or seven-year growth observation. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aggregate commercial and defense delivery growth constrains the commercial-demand scenario without establishing this grade's attributable consumption. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported defense-engine delivery growth is a demand-exposure check only; the PWA xx.xx activity factor remains assumed. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

18.14. Brazil

Table 546. Brazil Nickel-Based Superalloys for Aerospace Market Size, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Brazil	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 547. Brazil Nickel-Based Superalloys for Aerospace Market Size, by Product Form, 2017-2040 (USD Million)

Product Form	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Bars, Rods and Profiles	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Billets and Forging Stock	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ingots	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Plate, Sheet, Strip and Foil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Powder	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Tubes and Pipes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Wire	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 548. Brazil Nickel-Based Superalloys for Aerospace Market Size, by Strengthening Class, 2017-2040 (USD Million)

Strengthening Class	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Dispersion-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Precipitation-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Solid-Solution-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 549. Brazil Nickel-Based Superalloys for Aerospace Market Size, by Component Application, 2017-2040 (USD Million)

Component Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Breathing Propulsion & Auxiliary Power	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Systems & Equipment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rocket & Spacecraft Propulsion	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Vehicle Structures & Thermal Protection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 550. Brazil Nickel-Based Superalloys for Aerospace Market Size, by Air-Breathing Propulsion & Auxiliary Power, 2017-2040 (USD Million)

Air-Breathing Propulsion & Auxiliary Power	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combustion & Exhaust Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Compressor Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine Structures & Auxiliary Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Blades & Vanes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Disks & Rotor Hardware	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 551. Brazil Nickel-Based Superalloys for Aerospace Market Size, by Demand Stage, 2017-2040 (USD Million)

Demand Stage	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Initial Equipment Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Repair, Overhaul & Refurbishment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Replacement & Retrofit Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research, Development & Qualification	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 552. Brazil Nickel-Based Superalloys for Aerospace Market Size, by Aerospace End Market, 2017-2040 (USD Million)

Aerospace End Market	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Civil & Nonmilitary State Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Guided Missile Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Military Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Space Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 553. Brazil Nickel-Based Superalloys for Aerospace Market Size, by Buyer Function, 2017-2040 (USD Million)

Buyer Function	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Aerospace Vehicle Manufacturers & Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Component & Subassembly Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine & Propulsion-System Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Maintenance, Repair & Overhaul Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Development Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 554. Brazil Nickel-Based Superalloys for Aerospace Market Size, by Fulfillment Model, 2017-2040 (USD Million)

Fulfillment Model	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Order-Dedicated Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stock Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 555. Brazil Nickel-Based Superalloys for Aerospace Market Size, by Supply Channel, 2017-2040 (USD Million)

Supply Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Captive Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent Intermediary Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Producer-Direct Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 556. Brazil Nickel-Based Superalloys for Aerospace Market Size, by Alloy Grade, 2017-2040 (USD Million)

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ABD-1000AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
ABD-900AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 556 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
AD730	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy 718Plus	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy X-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CM247LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CMSX-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hastelloy X	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713C	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-738LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
MAR-M xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic 80A	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene 88DT	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 556 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
RR1000	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet 720Li	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Waspaloy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. ATI Inc. - 2025 Form 10-K

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC's reported financial/product-category inputs and listed ingot offering constrain the eligible material envelope; the ingot allocation remains assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: AA&S sales of USD xx.xx and its xx.xx% nickel-based/specialty-alloy category anchor the separately adjusted rolled-material envelope.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial jet-engine revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025, supporting purchasing recovery but not identifying price growth or a 2032 material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))

2. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
3. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Narrow-strip supply supports a limited flat-product allocation within the modeled eligible Carpenter envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire is a disclosed supplied form; its eligible monetary weight remains modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.

4. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical xx.xx% slab/bar/billet revenue category constrains the long-stock proxy; its eligible billet split is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported combined stock category provides a proxy anchor, not a separately disclosed bar revenue share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 flat products represented approximately xx.xx% of net product revenue; extrapolation to the eligible Acerinox envelope is modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 wire represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 tubulars represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical product revenue, channel mix and backlog conversion anchor the modeled stock value weight, with explicit scope adjustments.

5. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Casting-alloy activities support an ingot-material equivalent rather than attributing full engine-component revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed metal/billet activities support retaining a forging-stock allocation; the assumed xx.xx% weight is not reported.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported 2025 sales of USD xx.xx and Engine Products aerospace revenues of USD xx.xx commercial and USD xx.xx defense establish the component-cohort scale; USD xx.xx gas-turbine revenue is excluded through an explicit attribution model. These are not material-market revenues. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The segment/end-market revenue table supplies the aerospace and gas-turbine boundaries needed to bridge combined spares activity into an aerospace replacement-material proxy. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial aerospace represented xx.xx% of 2025 company sales, supplying an independent downstream mix comparison rather than a nickel-material allocation weight. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense aerospace represented xx.xx% of 2025 company sales; the paired commercial/defense comparison tests the aviation model while retaining component and material-scope differences. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.

6. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: GE describes repaired/serviceable-part reuse, supporting a counterforce to converting aftermarket activity directly into newly supplied material purchases. Its reported approximately xx.xx% strategic-nickel revert content is not deducted from the terminal-material market. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Commercial repair and component reuse support retaining uncertainty around replacement-related combustion material purchases. The selected procurement-intensity offset remains an assumption, not a measured avoided-purchase percentage. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
7. World Bank WITS / UN Comtrade - Plates, sheet, strip and foil, nickel alloy imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Brazil material input, not downstream aerospace sales.
8. World Bank WITS / UN Comtrade - Parts of turbo-jets or turbo-propellers imports by country, 2024
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Finished engine-parts imports independently test the exclusion of downstream component value from material demand.

9. Special Metals - Tech Center
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised ingot supply establishes a PCC material-form crosswalk, not its sales weight.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised billet supply supports the forging-stock category mapping within the inherited PCC envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised bar supply supports classification only; the monetary coefficient is an assumption.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Plate, sheet and strip offerings support a distinct flat-product allocation premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire availability supports the material-form crosswalk without establishing revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Tubing availability supports the material-form crosswalk without establishing revenue.
10. DPC Holdings Limited - Registration Statement with 2025 Financial Statements
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing separates ingots from component sales and describes external supply and xx.xx% internal superalloy sourcing, contradicting the inherited xx.xx% captive parameter.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
11. Acerinox - Results FY 2025
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned US long-product expansion supports the relative conventional-long-material premise; investment is not recognized as sales.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately USD xx.xx of planned platform investment includes expansion of the long-products offering, informing the bars forecast premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace demand and planned long-product diversification support testing a relative mix shift without assuming flat-product contraction.

12. Haynes International - HAYNES 282
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Powder is offered alongside conventional forms for HAYNES xx.xx supporting nonexclusive form classification, not an observed sales allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
13. CMA - Anticipated Acquisition of Haynes International by Acerinox: Full Text Decision
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct customer evidence in paragraphs xx.xx-xx.xx supports separate flat/long purchasing pools; no published market-share table is used.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Shape-specific purchasing supports a distinct long-stock allocation model without proving a separate competitive market for billet.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.

14. Haynes International - HAYNES 230
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
15. Carpenter Technology - Advanced Materials for Aerospace Motor & Engines
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))
16. Elementum 3D - Metal Alloy Additive Manufacturing Colorado
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed. ([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed. ([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))
17. NASA - NASA-Developed Printable Metal Can Take the Heat
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake. ([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake. ([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

18. Carpenter Technology - Lighter, Faster, Stronger Metallurgy for Defense, July 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights. ([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights. ([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))
19. Special Metals - Aerospace
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy xx.xx; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy X-xx.xx; no current sales quantity is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Waspaloy; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

20. Boeing - BDS Terms and Conditions Guide, D607 Material Substitution Prohibition, November 15, 2013
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: D607 prohibits unauthorized material substitutions while recognizing specified alternatives. It constrains assumptions about frictionless cross-class substitution, without quantifying adoption delays. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization requirements qualify assumptions about precipitation-family substitution opportunities; the clause does not prove future purchases or a class-growth premium. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause prohibits unauthorized substitutions where contractually applicable. It constrains the adoption interpretation but does not establish approval prevalence or a numerical adoption rate. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific material authorization is a counterweight to treating a named offering as immediately substitutable production material. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization limits interpretation of the assumed adoption multiplier; it does not directly establish powder sales. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))

21. Precision Castparts Corp. - Fiscal 2015 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.

22. NASA - Chapter 2: Aerospace Materials Characteristics

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

23. ESA - ESA Space Environment Report 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
24. NASA and Superalloys: A Customer, a Participant, and a Referee
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
25. VDM Metals - Alloys for the Aerospace Industry
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
26. Carpenter Technology - Business Segments
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))

27. Howmet Aerospace - 2025 Annual Report, Letter to Shareholders

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% combined aerospace and gas-turbine spares revenue constrains the distinction between initial-production and spare-component activity; material and destination adjustments remain modeled. ([howmet.com](https://www.howmet.com/annualreport/))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed combined spares proportion supplies the replacement proxy; approximately xx.xx% commercial aerospace engine-spares growth is historical counterevidence against assuming weak aftermarket activity. ([howmet.com](https://www.howmet.com/annualreport/))

28. GE Aerospace - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment and services costs provide commercial budget anchors for the common material-value denominator; assumed eligible-material fractions prevent full equipment or service value from entering the allocation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Services include spare parts and maintenance activity, supporting an explicit new-article versus restoration attribution rather than equating services revenue with replacement-material purchases. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported USD xx.xx services cost anchors the restoration-material bridge; the restoration allocation and direct eligible-material fraction are assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Total funded R&D of USD xx.xx supplies a development-budget proxy, not observed nickel-material purchasing; only an assumed eligible-material fraction is used. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.

29. Rolls-Royce Holdings Plc - 2025 Full Year Results

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2028 shop-visit target is below the reported 2025 total despite prospective fleet growth, qualifying any automatic conversion of fleet expansion into proportionate maintenance-material purchasing.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The divergence between 2025 engine deliveries and shop visits independently challenges a uniform new-engine-led material forecast; no service revenue is included in the numerator.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Observed engine-delivery and shop-visit activity supports separate new-program and replacement-demand assumptions, not a proportional material-purchase conversion.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

30. UKRI - Accelerating Manufacturing Readiness level of ABD-1000AM for AM of high temperature aerospace components (AMRAM1000)
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The Alloyed-led project has xx.xx of funding and an April 2025-October 2026 funded period. This independently establishes bounded development activity, not annual material sales or recurring production purchases. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
31. Safran - FY 2025 Results and Investor Update, February 13, 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))

32. Airbus - Full-Year 2025 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 deliveries by aircraft family provide the starting activity comparison for the initial-production forecast; aircraft delivery value is not included in the material numerator. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx% decline in 2025 self-financed R&D is counterevidence to uniform development-budget acceleration and supports a restrained, explicitly assumed development-purchasing scenario. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.

33. Airbus - Half-Year 2026 Results

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 update retained the A320-family, A350 and other production-rate targets, providing a dated commercial constraint on the initial-production activity scenario rather than proof of future material orders. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: First-half 2026 self-financed R&D of EUR xx.xx versus EUR xx.xx provides a modest-growth countercheck for the assumed development-project activity path; the budget is not material-market revenue. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))

34. RTX Corporation - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

35. Federal Reserve Bank of St. Louis - Annual USD/GBP Exchange Rate, AEXUSUK

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))

36. L3Harris Technologies, Inc. - Fiscal 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))

37. FAA Aerospace Forecast Fiscal Years 2025-2045 - Commercial Space

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated official low/high scenarios provide FY2032 licensed launch/reentry activity bounds. Their U.S.-licensed scope and treatment of reusable vehicles prevent direct conversion into Global material revenue. ([faa.gov](https://www.faa.gov/data_research/aviation/aerospace_forecasts/2025-commercial-space.pdf))

38. ICAO - Convention on International Civil Aviation, Ninth Edition

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))

39. DFARS 252.225-7009 - Restriction on Acquisition of Certain Articles Containing Specialty Metals
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
40. Aubert & Duval - Space Industry Metallurgical Solutions
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
41. Aubert & Duval - Metallurgical Solutions for the Defense Industry, June 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
42. Berkshire Hathaway Inc. - 2025 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.

43. Lufthansa Group Annual Report 2025 - MRO business segment
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
44. Oliver Wyman - Global Fleet And MRO Market Forecast 2026-2036: Key Trends
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
45. German Aerospace Center (DLR) - Financing
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
46. Federal Aviation Administration - Parts Manufacturer Approval (PMA): Design Approval
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.

47. Rolled Alloys - E-Services Stocking Programs
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
48. Boeing BDS Terms and Conditions Guide - D604 Raw Material Risk Mitigation
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
49. Carpenter Technology Corporation - Second Quarter Fiscal 2026 Earnings Call Presentation, January 29, 2026
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation distinguishes specialized non-LTA business from a conventional spot market, countering automatic classification of transactional sales as stock.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Three additional aerospace LTAs and xx.xx% sequential commercial-aerospace bookings growth inform the reservation hypothesis, but do not measure its modeled magnitude.
50. Precision Castparts Corp. - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.

51. Howmet Aerospace - United States Locations
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
52. ATI Inc. - 2024 Annual Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New sales commitments through 2040, including amounts expected during the remainder of the decade and predominantly involving jet-engine nickel alloys, inform the direct-program forecast premise without being counted as realized sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% of fiscal-2024 plate volume went to independent service centers, providing a historical comparison that cautions against assuming generalized intermediary displacement.
53. Alloyed - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.

54. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 aerospace realization and revenue provide the common monetary calibration for this modeled grade; neither is a grade-specific sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace material realization supplies a price-scale input, with modeled year and product-mix adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization calibrates the assumed blended material price, not this grade's observed revenue. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace realization provides a shared monetary comparison for the assumed grade price. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported eight-to-ten-year aerospace application-introduction periods constrain interpretation of the seven-year adoption forecast. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace application-introduction periods provide an adoption-delay counterweight, not a forecast sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
55. European Commission CORDIS - Welding Metallurgy and Cracking in Superalloys: Reporting
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical all-sector tonnage discussion is only a dominance cross-check; it cannot establish current aerospace monetary share. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies 718Plus separately from ordinary xx.xx supporting identity separation without supplying a current sales weight. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
56. Special Metals - Alloy Surcharge Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: August-October 2026 grade surcharges provide a differentiated cost-exposure check, not full invoice prices or observed 2032 prices. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx surcharge sequence independently qualifies a uniform price assumption; it is not substituted for a material selling price. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The grade-specific surcharge listing is a commercial cost comparison, not an observed Global grade realization. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))

57. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current-and-past supplier identity mapping only; not proof of 2025 aerospace sales or the modeled volume. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: CMSX-xx.xx is separately identified; the material-value weight remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current sales are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713C is listed separately from IN-713LC; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713LC is listed separately from IN-713C; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx identity mapping only; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-738LC is separately identified; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current aerospace tonnes are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx appears in a current-and-past identification list; this does not establish recurring aerospace production sales. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: MAR-M xx.xx is identified separately from CM247LC; monetary weights remain modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PWA xx.xx is separately identified; no attributable sales value is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; current commercial scale remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; no current grade-specific material sales are disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Udimet xx.xx appears in the supplier's current-and-past identities; aerospace attribution is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

58. GE Aerospace - Safety First: A Retiring GE Aerospace Materials Engineer Made Protecting Lives His Mission
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
59. Aubert & Duval - AD730: Ni-Based Superalloy for High Temperature Applications
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
60. University of Portsmouth - Improved Creep-Fatigue-Oxidation Resistance in Gas Turbine Disc Materials: REF Impact Case Study
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))

61. Influence of Long Term Exposure in Air on Microstructure, Surface Stability and Mechanical Properties of UDIMET 720LI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The aerospace-industry publication distinguishes conventional Udimet xx.xx from its 720Li derivative; it does not establish a current monetary allocation. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The publication independently supports the 720Li identity and aircraft-engine-disc category, without supplying current sales. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

62. NASA Contractor Report 174639 - Literature Survey on Oxidations and Fatigue Lives at Elevated Temperatures

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical institutional material identification is a legacy-category anchor only; it does not demonstrate current aerospace material sales. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

63. America Makes - 5566.002 Proliferation of Nickel Superalloy Material Datasets for Powder Bed Fusion Additive Manufacturing

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))

64. GE Aerospace - Fourth Quarter 2025 Earnings Presentation

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 commercial-engine delivery growth supplies a near-term demand cross-check, not a grade-specific purchasing or seven-year growth observation. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aggregate commercial and defense delivery growth constrains the commercial-demand scenario without establishing this grade's attributable consumption. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported defense-engine delivery growth is a demand-exposure check only; the PWA xx.xx activity factor remains assumed. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

18.15. Australia

Table 557. Australia Nickel-Based Superalloys for Aerospace Market Size, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 558. Australia Nickel-Based Superalloys for Aerospace Market Size, by Product Form, 2017-2040 (USD Million)

Product Form	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Bars, Rods and Profiles	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Billets and Forging Stock	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ingots	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Plate, Sheet, Strip and Foil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Powder	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Tubes and Pipes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Wire	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 559. Australia Nickel-Based Superalloys for Aerospace Market Size, by Strengthening Class, 2017-2040 (USD Million)

Strengthening Class	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Dispersion-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Precipitation-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Solid-Solution-Strengthened Alloys	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 560. Australia Nickel-Based Superalloys for Aerospace Market Size, by Component Application, 2017-2040 (USD Million)

Component Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Breathing Propulsion & Auxiliary Power	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Systems & Equipment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rocket & Spacecraft Propulsion	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Vehicle Structures & Thermal Protection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 561. Australia Nickel-Based Superalloys for Aerospace Market Size, by Air-Breathing Propulsion & Auxiliary Power, 2017-2040 (USD Million)

Air-Breathing Propulsion & Auxiliary Power	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combustion & Exhaust Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Compressor Components	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine Structures & Auxiliary Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Blades & Vanes	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turbine Disks & Rotor Hardware	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 562. Australia Nickel-Based Superalloys for Aerospace Market Size, by Demand Stage, 2017-2040 (USD Million)

Demand Stage	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Initial Equipment Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Repair, Overhaul & Refurbishment	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Replacement & Retrofit Production	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research, Development & Qualification	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 563. Australia Nickel-Based Superalloys for Aerospace Market Size, by Aerospace End Market, 2017-2040 (USD Million)

Aerospace End Market	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Civil & Nonmilitary State Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Guided Missile Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Military Aviation	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Space Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 564. Australia Nickel-Based Superalloys for Aerospace Market Size, by Buyer Function, 2017-2040 (USD Million)

Buyer Function	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Aerospace Vehicle Manufacturers & Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Component & Subassembly Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Engine & Propulsion-System Manufacturers	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Maintenance, Repair & Overhaul Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Development Organizations	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 565. Australia Nickel-Based Superalloys for Aerospace Market Size, by Fulfillment Model, 2017-2040 (USD Million)

Fulfillment Model	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Order-Dedicated Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stock Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 566. Australia Nickel-Based Superalloys for Aerospace Market Size, by Supply Channel, 2017-2040 (USD Million)

Supply Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Captive Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent Intermediary Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Producer-Direct Supply	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 567. Australia Nickel-Based Superalloys for Aerospace Market Size, by Alloy Grade, 2017-2040 (USD Million)

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ABD-1000AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
ABD-900AM	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 567 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
AD730	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy 718Plus	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy X-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Alloy xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CM247LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
CMSX-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hastelloy X	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Haynes xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713C	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-713LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-738LC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
IN-xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
MAR-M xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic 80A	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nimonic xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
PWA xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene 88DT	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 567 - continued

Alloy Grade	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Rene xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
RR1000	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet 720Li	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Udimet xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Waspaloy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. ATI Inc. - 2025 Form 10-K

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: Commercial jet-engine sales growth provides a near-term demand indicator, not an observed global market growth rate.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC's reported financial/product-category inputs and listed ingot offering constrain the eligible material envelope; the ingot allocation remains assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: HPMC supplies long materials including billet; engine-material positioning informs the modeled forging-stock envelope and relative-demand premise.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: AA&S sales of USD xx.xx and its xx.xx% nickel-based/specialty-alloy category anchor the separately adjusted rolled-material envelope.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Advanced powder offerings and expected increased usage support commercial classification and a forecast premise, not a disclosed powder share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The AA&S and HPMC product distinctions constrain the flat-oriented versus high-strength-oriented material proxies. Reported segment growth also challenges an automatic relative-growth advantage; neither segment is a strengthening-class sales disclosure. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2025 nickel/specialty-alloy product shares were xx.xx% in HPMC and xx.xx% in AA&S. Aerospace-and-defense growth was xx.xx% and xx.xx%, respectively. These are cohort-model inputs and forecast constraints, not observed precipitation-family shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 filing separates HPMC and AA&S product exposures, supporting distinct material-value cohorts rather than treating all supplier revenue as interchangeable application demand. Final application coefficients remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disc-quality mill products, precision forgings and engine-material supply relationships support the rotor-stock cohort classification and forecast premise, not the final disk percentage. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial jet-engine revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025, supporting purchasing recovery but not identifying price growth or a 2032 material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ati-xx.xx.htm))

2. Carpenter Technology Corporation - 2026 Annual Report on Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Fiscal 2026 aerospace-and-defense growth constrains the current-year demand assumption while retaining product-mix and reporting-period differences.
3. Carpenter Technology Corporation - 2025 Annual Report on Form 10-K
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue provides a historical supplier-recovery calibration input.
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Reported aerospace-and-defense revenue constrains the modeled historical recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Disclosed billet activity and aerospace sales constrain the long-material proxy; the within-envelope billet weight is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Bar and rod offerings and aerospace engine/fastener demand support the bars classification and relative activity premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Narrow-strip supply supports a limited flat-product allocation within the modeled eligible Carpenter envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire is a disclosed supplied form; its eligible monetary weight remains modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PEP aerospace-and-defense revenue of USD xx.xx constrains powder attribution; its decline and additive restructuring qualify the adoption forecast.

4. Haynes International, Inc. - 2023 Form 10-K
   - Evidence informing the 2019 market-value input; displayed series and growth include calculations: Aerospace shipment value anchors the pre-pandemic comparison.
   - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the pandemic contraction.
   - Evidence informing the 2021 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the inventory-cycle trough.
   - Evidence informing the 2022 market-value input; displayed series and growth include calculations: Aerospace shipment value constrains the subsequent recovery.
   - Evidence informing the 2023 market-value input; displayed series and growth include calculations: Aerospace sales and realized pricing constrain the historical value recovery.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical xx.xx% slab/bar/billet revenue category constrains the long-stock proxy; its eligible billet split is assumed.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported combined stock category provides a proxy anchor, not a separately disclosed bar revenue share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 flat products represented approximately xx.xx% of net product revenue; extrapolation to the eligible Acerinox envelope is modeled.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 wire represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2023 tubulars represented approximately xx.xx% of net product revenue, providing a historical value-mix proxy.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product-form revenues were approximately xx.xx% sheet/coil/plate, xx.xx% tubulars, xx.xx% wire and xx.xx% slab/bar/billet. This supports a flat-heavy commercial proxy, subject to aerospace, year and strengthening-family adjustments. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing identifies commercial aerospace participation by Haynes xx.xx qualifying any assumption that the supplier's flat-product business belongs entirely to solid-solution alloys. It does not disclose class-specific sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 product revenue mix was approximately xx.xx% sheet/coil/plate and xx.xx% tubular, supplying the xx.xx% flat/tubular proxy used in the material cohort model. Aerospace and 2025 extrapolation remain assumptions. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported xx.xx% wire and xx.xx% slab/bar/billet revenue provide the complementary xx.xx% long/wire proxy. The source supports a material-form input, not structural-equipment sales. ([haynesintl.com](https://haynesintl.com/wp-content/uploads/2024/xx.xx/Haynes-Intl-10K.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical product revenue, channel mix and backlog conversion anchor the modeled stock value weight, with explicit scope adjustments.

5. Howmet Aerospace Inc. - 2025 Form 10-K
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: Growth across aerospace and engine spares supports continued purchasing activity, without establishing a corresponding percentage increase in nickel-material demand.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Casting-alloy activities support an ingot-material equivalent rather than attributing full engine-component revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Disclosed metal/billet activities support retaining a forging-stock allocation; the assumed xx.xx% weight is not reported.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Engine Products includes airfoils and structural parts; approximately xx.xx% segment sales growth in 2025 supplies an independent commercial comparison, not an aerospace-material growth rate. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed mix of rotating and structural engine products supports separating these purchasing exposures rather than assigning all casting-related material to airfoils. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported 2025 sales of USD xx.xx and Engine Products aerospace revenues of USD xx.xx commercial and USD xx.xx defense establish the component-cohort scale; USD xx.xx gas-turbine revenue is excluded through an explicit attribution model. These are not material-market revenues. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The segment/end-market revenue table supplies the aerospace and gas-turbine boundaries needed to bridge combined spares activity into an aerospace replacement-material proxy. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Commercial aerospace represented xx.xx% of 2025 company sales, supplying an independent downstream mix comparison rather than a nickel-material allocation weight. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense aerospace represented xx.xx% of 2025 company sales; the paired commercial/defense comparison tests the aviation model while retaining component and material-scope differences. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Engine Products sales of USD xx.xx and identifies third-party raw-material purchasing. These constrain the component purchasing pool and its forecast starting weight; the source does not disclose the modeled material coefficients or global share.

6. GE Aerospace - 2025 Sustainability Report
   - Evidence informing the 2030 market-value input; displayed series and growth include calculations: Repair and serviceable-part reuse establish a commercial counterforce to mechanically converting maintenance activity into new-material purchases; the forecast offset remains assumed.
   - Evidence informing the 2032 market-value input; displayed series and growth include calculations: Lifecycle alternatives support retaining uncertainty around replacement-material intensity rather than assuming unchanged purchasing per maintained engine.
   - Evidence informing the 2040 market-value input; displayed series and growth include calculations: Lifecycle alternatives inform long-run demand sensitivity, not direct verification of the forecast value.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: GE describes repaired/serviceable-part reuse, supporting a counterforce to converting aftermarket activity directly into newly supplied material purchases. Its reported approximately xx.xx% strategic-nickel revert content is not deducted from the terminal-material market. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Commercial repair and component reuse support retaining uncertainty around replacement-related combustion material purchases. The selected procurement-intensity offset remains an assumption, not a measured avoided-purchase percentage. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Restoration and used-serviceable parts are alternatives to new replacements, supporting a replacement-material offset mechanism but not its assumed numerical magnitude. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report establishes restoration as a commercial activity distinct from newly manufactured replacement articles; eligible material spending within that activity remains modeled. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/2025-sustainability-report.pdf))
7. Special Metals - Tech Center
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised ingot supply establishes a PCC material-form crosswalk, not its sales weight.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised billet supply supports the forging-stock category mapping within the inherited PCC envelope.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Advertised bar supply supports classification only; the monetary coefficient is an assumption.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Plate, sheet and strip offerings support a distinct flat-product allocation premise.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Wire availability supports the material-form crosswalk without establishing revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Tubing availability supports the material-form crosswalk without establishing revenue.

8. DPC Holdings Limited - Registration Statement with 2025 Financial Statements
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing separates ingots from component sales and describes external supply and xx.xx% internal superalloy sourcing, contradicting the inherited xx.xx% captive parameter.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace revenue increased from USD xx.xx in 2024 to USD xx.xx in 2025. The company describes predominantly new-build structural casting exposure, supplying a lifecycle comparison rather than a global structural-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned aerospace airfoil expansion is described as adding replacement exposure. It supports distinguishing lifecycle assumptions but does not establish a current material award or universal replacement frequency. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The filing describes xx.xx% internal aerospace and IGT superalloy requirements being supplied internally alongside external superalloy sales; this informs allocation and exposes the frozen sourcing-assumption discrepancy.
9. Acerinox - Results FY 2025
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned US long-product expansion supports the relative conventional-long-material premise; investment is not recognized as sales.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately USD xx.xx of planned platform investment includes expansion of the long-products offering, informing the bars forecast premise.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aerospace demand and planned long-product diversification support testing a relative mix shift without assuming flat-product contraction.
10. Haynes International - HAYNES 282
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Powder is offered alongside conventional forms for HAYNES xx.xx supporting nonexclusive form classification, not an observed sales allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Haynes xx.xx is identified as gamma-prime-strengthened, with aeroengine positioning and offerings across flat and other material forms. This prevents equating flat-product revenue or delivered condition with solid-solution classification. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))

11. CMA - Anticipated Acquisition of Haynes International by Acerinox: Full Text Decision
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct customer evidence in paragraphs xx.xx-xx.xx supports separate flat/long purchasing pools; no published market-share table is used.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Shape-specific purchasing supports a distinct long-stock allocation model without proving a separate competitive market for billet.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original supply-chain findings in paragraphs xx.xx-xx.xx identify manufacturer-operated stocking and independent stockists, supporting separation of fulfillment from ownership.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Original customer findings recognize lead-time and availability considerations; these constrain classification but provide no dedicated-share percentage.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Manufacturer-operated service-center supply belongs to the direct channel rather than automatically to independent distribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors and stockists constitute a distinct commercial route; no market-research-derived channel share is used.
12. Haynes International - HAYNES 230
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies Haynes xx.xx as solid-solution-strengthened and positions it for aerospace combustion hardware. This establishes commercial category mapping, not a sales weight. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The producer identifies combustion cans, transition ducts and related gas-turbine applications for HAYNES xx.xx. This supports commercial classification of the flat/tubular cohort, not an observed application sales percentage. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))

13. Carpenter Technology - Advanced Materials for Aerospace Motor & Engines

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation.
([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The engine-material portfolio identifies xx.xx and Waspaloy as precipitation-family nickel alloys serving structural and rotating-engine applications. It supports the high-strength cohort's classification premise, but supplies no numerical class allocation.
([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))

14. Elementum 3D - Metal Alloy Additive Manufacturing Colorado

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed.
([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The company's 2025 history entry reports over xx.xx tons of GRX-xx.xx nickel superalloy sold to xx.xx customers. These are the reported quantity and customer anchors for the explicitly assumed price, aerospace-attribution, coverage and adoption model. No future sales are observed.
([elementum3d.com](https://www.elementum3d.com/about-metal-alloy-additive-manufacturing/))

15. NASA - NASA-Developed Printable Metal Can Take the Heat

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake.
([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The August xx.xx 2025 publication identifies GRX-xx.xx as an ODS commercial offering and describes customer supply from small batches to over a ton, including aviation and commercial-space interest. It corroborates commercial activity, not the modeled price, annual Global value or forecast uptake.
([nasa.gov](https://www.nasa.gov/technology/tech-transfer-spinoffs/nasa-developed-printable-metal-can-take-the-heat/))

16. Carpenter Technology - Lighter, Faster, Stronger Metallurgy for Defense, July 2025

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July-2025 presentation identifies a separate licensed GRX-xx.xx ODS commercial offering. This supports allowing supplier activity beyond the observed sales cohort; it does not establish a coverage percentage or justify equal licensee weights.
([carpentertechnology.com](https://www.carpentertechnology.com/hubfs/presentations/Metallurgy-for-Defense_Presentation_NATO_F.pdf))

17. Special Metals - Aerospace
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated aerospace portfolio lists INCONEL MA754. This preserves a legacy-category lead while leaving current deliveries and revenue unresolved; it is not used as a numerical sales weight. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy xx.xx; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Alloy X-xx.xx; no current sales quantity is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace portfolio mapping for Waspaloy; no sales weight is disclosed. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))

18. Boeing - BDS Terms and Conditions Guide, D607 Material Substitution Prohibition, November 15, 2013
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: D607 prohibits unauthorized material substitutions while recognizing specified alternatives. It constrains assumptions about frictionless cross-class substitution, without quantifying adoption delays. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization requirements qualify assumptions about precipitation-family substitution opportunities; the clause does not prove future purchases or a class-growth premium. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contractual material controls and supply-chain ownership traceability support distinguishing the component establishment purchasing material from the customer controlling acceptance. The clause supplies an attribution premise, not a quantitative weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Acceptance and contractual authority do not by themselves establish ownership of every upstream material purchase, supporting the engine-system model's separate purchasing-title retention assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Integrator material requirements apply contractually through suppliers, supporting exclusion of supplier-owned material purchases from automatic attribution to the vehicle integrator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause prohibits unauthorized substitutions where contractually applicable. It constrains the adoption interpretation but does not establish approval prevalence or a numerical adoption rate. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific material authorization is a counterweight to treating a named offering as immediately substitutable production material. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific authorization limits interpretation of the assumed adoption multiplier; it does not directly establish powder sales. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))

19. Precision Castparts Corp. - Fiscal 2015 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Investment Cast Products revenue of USD xx.xx and Forged Products revenue of USD xx.xx provide the historical cast/forged calibration inputs. Scope, material-value and temporal adjustments are explicit assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same historical segment inputs constrain the complementary long/forged material cohort; they are not observed 2025 material revenues or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/pcp2015052810k.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Discloses a xx.xx% aerospace sales mix in fiscal 2015. This supplies a historical calibration lead for PCC's assumed aerospace attribution; it does not establish its 2025 mix or either final allocation.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Fiscal-2015 Forged Products intercompany activity of USD xx.xx and external sales of USD xx.xx calibrate a historical internal-activity ratio, not a directly observed nickel-material captive share.

20. NASA - Chapter 2: Aerospace Materials Characteristics

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA distinguishes nickel-superalloy compressor applications from turbine disks and blades, supporting the compressor numerator boundary without supplying its monetary weight. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Rocket-engine superalloy applications are identified separately from aircraft engines, supporting rocket attribution rather than inclusion in air-breathing component numerators. No current procurement value is disclosed. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

21. ESA - ESA Space Environment Report 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2026 report records more than xx.xx launches and more than xx.xx newly orbited payloads during 2025. These constrain contemporary space activity; purchasing intensity and the 2032 activity scenario remain modeled. ([esa.int](https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2026))
22. NASA and Superalloys: A Customer, a Participant, and a Referee
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NASA documents historical IN718 backing structures associated with Shuttle thermal protection. This establishes a destination boundary, not continuing 2025 procurement or a forecast award. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Historical IN718 space-station battery pressure vessels establish a non-propulsion equipment application. Current attributable sales and forecast scale are explicitly estimated rather than inferred from that historical program. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf?attachment=true))
23. VDM Metals - Alloys for the Aerospace Industry
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The commercial aerospace brochure identifies nickel-alloy fuselage structural parts and fasteners, independently corroborating non-engine destinations. Product availability is not used as a sales-count weight. ([vdm-metals.com](https://www.vdm-metals.com/fileadmin/user_upload/Downloads/Brochures/VDM_Metals_Aerospace.pdf))
24. Carpenter Technology - Business Segments
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Carpenter identifies commercial long-product superalloy offerings, supporting classification of its inherited eligible material contribution in the long/wire cohort. It does not disclose the modeled compressor allocation. ([carpentertechnology.com](https://www.carpentertechnology.com/business-segments))

25. Howmet Aerospace - 2025 Annual Report, Letter to Shareholders

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% combined aerospace and gas-turbine spares revenue constrains the distinction between initial-production and spare-component activity; material and destination adjustments remain modeled. ([howmet.com](https://www.howmet.com/annualreport/))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed combined spares proportion supplies the replacement proxy; approximately xx.xx% commercial aerospace engine-spares growth is historical counterevidence against assuming weak aftermarket activity. ([howmet.com](https://www.howmet.com/annualreport/))

26. GE Aerospace - 2025 Form 10-K

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment and services costs provide commercial budget anchors for the common material-value denominator; assumed eligible-material fractions prevent full equipment or service value from entering the allocation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Services include spare parts and maintenance activity, supporting an explicit new-article versus restoration attribution rather than equating services revenue with replacement-material purchases. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported USD xx.xx services cost anchors the restoration-material bridge; the restoration allocation and direct eligible-material fraction are assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Total funded R&D of USD xx.xx supplies a development-budget proxy, not observed nickel-material purchasing; only an assumed eligible-material fraction is used. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 CES equipment revenue of USD xx.xx and services revenue of USD xx.xx, providing separately scoped baseline inputs and commercial growth signals for the civil aviation model; it does not report nickel-material purchases or 2032 shares. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 Defense & Systems revenue of USD xx.xx, distinct from the broader DPT segment; this is a scoped propulsion proxy requiring assumed aviation and material-value adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/ge-xx.xx.htm))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separately reports 2025 equipment revenue of USD xx.xx for Commercial Engines & Services and USD xx.xx for Defense & Propulsion Technologies. Their sum anchors the scope-adjusted engine-system purchasing model and avoids using total services revenue as material procurement.

27. Rolls-Royce Holdings Plc - 2025 Full Year Results

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New and in-service destinations for the same certified improvement support purpose-based attribution. Reported engine deliveries and 2028 OE delivery targets constrain the initial-production scenario without measuring material orders.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Large-engine deliveries and major shop visits support an independent activity-ratio check. The comparison requires an assumed material purchase-value equivalent and does not disclose the final replacement share.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2028 shop-visit target is below the reported 2025 total despite prospective fleet growth, qualifying any automatic conversion of fleet expansion into proportionate maintenance-material purchasing.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates civil equipment and aftermarket receipts and identifies prior-period revenue recognition; its year-end engine backlog supplies a forecast demand indicator, not a material commitment.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Separates defence equipment from aftermarket revenue while also describing non-aviation defence businesses, supporting an explicit aviation-retention adjustment rather than using all defence revenue as aircraft material demand.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The divergence between 2025 engine deliveries and shop visits independently challenges a uniform new-engine-led material forecast; no service revenue is included in the numerator.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Observed engine-delivery and shop-visit activity supports separate new-program and replacement-demand assumptions, not a proportional material-purchase conversion.
([rolls-royce.com](https://www.rolls-royce.com/investors/results-reports-and-presentations/financial-results/rr-holdings-plc-2025-full-year-results.aspx))

28. UKRI - Accelerating Manufacturing Readiness level of ABD-1000AM for AM of high temperature aerospace components (AMRAM1000)
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The Alloyed-led project has xx.xx of funding and an April 2025-October 2026 funded period. This independently establishes bounded development activity, not annual material sales or recurring production purchases. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies separately funded industrial and university participants, including total funded value of GBP xx.xx and a GBP xx.xx Cranfield University grant. This supports excluding consortium budgets and prospective component sales from material revenue and does not identify each material purchaser.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The April 2025-October 2026 period, GBP xx.xx funding and participant project costs provide budget and timing primitives for the modeled material-spending bridge. They establish development activity, not recurring production procurement or 2032 sales. ([gtr.ukri.org](https://gtr.ukri.org/projects?ref=xx.xx))
29. Safran - FY 2025 Results and Investor Update, February 13, 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: LEAP delivery expansion and the disclosed low-double-digit spare-engine ratio constrain, but do not directly measure, the division between first-installation and replacement-destination material. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected LEAP installed-base and shop-visit expansion supports continuing replacement demand, while the expected CFM56 shop-visit decline from 2029 qualifies extrapolation of the current surge. Installed stock is not treated as annual material revenue. ([safran-group.com](https://www.safran-group.com/download/media/xx.xx))

30. Airbus - Full-Year 2025 Results

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 deliveries by aircraft family provide the starting activity comparison for the initial-production forecast; aircraft delivery value is not included in the material numerator. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx% decline in 2025 self-financed R&D is counterevidence to uniform development-budget acceleration and supports a restrained, explicitly assumed development-purchasing scenario. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-full-year-fy-2025-results))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 consolidated revenue of EUR xx.xx, xx.xx commercial aircraft deliveries and a subsequent 2026 delivery target of approximately xx.xx. These constrain commercial scale and recovery assumptions, not the direct nickel-material purchasing coefficient.

31. Airbus - Half-Year 2026 Results

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 update retained the A320-family, A350 and other production-rate targets, providing a dated commercial constraint on the initial-production activity scenario rather than proof of future material orders. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: First-half 2026 self-financed R&D of EUR xx.xx versus EUR xx.xx provides a modest-growth countercheck for the assumed development-project activity path; the budget is not material-market revenue. ([airbus.com](https://www.airbus.com/en/newsroom/press-releases/2026-xx.xx-airbus-reports-half-year-h1-2026-results))

32. RTX Corporation - 2025 Form 10-K

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's 2025 commercial aerospace and other commercial revenue is USD xx.xx versus USD xx.xx in 2024; these are commercial receipts, not material sales or a pure legal-status classification. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Pratt & Whitney's government customer categories sum to USD xx.xx in 2025 and constrain the military propulsion proxy, with nonmilitary-state attribution remaining an explicit limitation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/rtx-xx.xx.htm))

33. Federal Reserve Bank of St. Louis - Annual USD/GBP Exchange Rate, AEXUSUK
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The annual 2025 exchange rate is USD xx.xx per GBP, used to make the civil propulsion proxy inputs monetarily comparable before forecast roll-forward. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same annual currency bridge converts the GBP military aviation proxy inputs; it does not measure category demand or future exchange rates. ([fred.stlouisfed.org](https://fred.stlouisfed.org/data/AEXUSUK))
34. L3Harris Technologies, Inc. - Fiscal 2025 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the combined 2025 Aerojet Rocketdyne revenue anchor and a USD xx.xx space-sector revenue increase associated with a NASA program. The assumed sector split, material ratio and global coverage remain modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports USD xx.xx of combined segment revenue and a USD xx.xx increase in missile activity; these constrain commercial scale and forecast direction without establishing nickel-material share. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hrs-xx.xx.htm))
35. FAA Aerospace Forecast Fiscal Years 2025-2045 - Commercial Space
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated official low/high scenarios provide FY2032 licensed launch/reentry activity bounds. Their U.S.-licensed scope and treatment of reusable vehicles prevent direct conversion into Global material revenue. ([faa.gov](https://www.faa.gov/data_research/aviation/aerospace_forecasts/2025-commercial-space.pdf))
36. ICAO - Convention on International Civil Aviation, Ninth Edition
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Article xx.xx distinguishes civil from state aircraft and includes customs and police services in the state concept, supporting the combined category boundary without assigning a common permission regime or a sales weight. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military aircraft fall within the state-aircraft concept; this is a classification premise, not evidence of aggregate material demand. ([icao.int](https://www.icao.int/sites/default/files/2024-xx.xx/7300_9ed.pdf))

37. DFARS 252.225-7009 - Restriction on Acquisition of Certain Articles Containing Specialty Metals
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The clause recognizes qualifying-country routes and specified exceptions, supporting the decision not to infer a uniform sourcing restriction, price premium or market-access probability from military destination alone. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Contract-specific specialty-metal conditions provide an access caveat, not a quantitative guided-missile sales allocation. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
38. Aubert & Duval - Space Industry Metallurgical Solutions
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Identifies nickel-superalloy offerings within the company's space portfolio, independently supporting commercial category participation only; no portfolio count or program listing is used as a sales weight. ([aubertduval.com](https://www.aubertduval.com/wp-media/uploads/2022/xx.xx/Space_brochure_202207.pdf))
39. Aubert & Duval - Metallurgical Solutions for the Defense Industry, June 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The missile portfolio identifies AD730 and PYRAD53NW/INCO718 nickel-alloy offerings, supporting commercial classification without establishing current revenue, material intensity or a program award. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/Brochure-Defense-xx.xx.pdf))
40. Berkshire Hathaway Inc. - 2025 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports PCC revenue of approximately USD xx.xx in 2025 and aerospace revenue growth. The revenue scale anchors an adjusted component-material purchasing proxy, not a directly observed alloy procurement total.

41. Lufthansa Group Annual Report 2025 - MRO business segment
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports 2025 MRO revenue of EUR xx.xx and EUR xx.xx in raw materials, consumables and supplies, separately from external services. Their ratio supports the accounting-spend bridge; the eligible nickel-material retention and forecast remain modeled.
42. Oliver Wyman - Global Fleet And MRO Market Forecast 2026-2036: Key Trends
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The consulting firm's updated assessment estimates 2025 commercial MRO demand at USD xx.xx and discusses fleet-aging and maintenance-growth scenarios. It anchors adjusted maintenance activity, not nickel-material sales or a directly verified buyer share.
43. German Aerospace Center (DLR) - Financing
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports total DLR financing of EUR xx.xx in 2023 and EUR xx.xx in 2024. These constrain institutional research scale and the historical funding bridge; aerospace retention, material purchasing and global coverage are explicit assumptions.
44. Federal Aviation Administration - Parts Manufacturer Approval (PMA): Design Approval
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Recognizes repair-station fabrication for an eligible in-house repair while distinguishing it from separate article sales. This supports the MRO material-consuming role and the exclusion of finished replacement-article turnover; it does not quantify material demand.

45. Rolled Alloys - E-Services Stocking Programs
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and supplier-held ready inventory establish why location alone cannot determine unreserved stock availability.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier-held customer orders and schedules requiring contract or LTA terms support classifying reserved inventory as dedicated.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-site replenishment and distributor-held release programs establish commercial inventory-service arrangements, not their sales prevalence or an automatic channel-growth premium.
46. Boeing BDS Terms and Conditions Guide - D604 Raw Material Risk Mitigation
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Stock-on-hand documentation is an accepted assurance route under the clause; this supports category treatment, not stock prevalence.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Long-term contracts and written mill assurances are alternative documentation routes where the clause applies, without proving preference or market share.
47. Carpenter Technology Corporation - Second Quarter Fiscal 2026 Earnings Call Presentation, January 29, 2026
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation distinguishes specialized non-LTA business from a conventional spot market, countering automatic classification of transactional sales as stock.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Three additional aerospace LTAs and xx.xx% sequential commercial-aerospace bookings growth inform the reservation hypothesis, but do not measure its modeled magnitude.
48. Precision Castparts Corp. - About
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Corporate history describes internal coverage of casting nickel-ingot requirements and more than xx.xx% of forging billet requirements, supporting integration while using a different denominator from material-output channel share.

49. Howmet Aerospace - United States Locations
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Official location descriptions corroborate alloy and investment-casting operations; they do not independently measure the retained captive-material valuation.

50. ATI Inc. - 2024 Annual Report
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: New sales commitments through 2040, including amounts expected during the remainder of the decade and predominantly involving jet-engine nickel alloys, inform the direct-program forecast premise without being counted as realized sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately xx.xx% of fiscal-2024 plate volume went to independent service centers, providing a historical comparison that cautions against assuming generalized intermediary displacement.

51. Alloyed - About
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The recorded 2019 ABD licensing agreement supports a named commercial rights relationship but supplies no producer-direct revenue weight.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The licensing history does not establish unrestricted independent resale rights or attributable intermediary sales, preventing an unsupported licensing-related allocation increment.

52. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-2023 aerospace realization and revenue provide the common monetary calibration for this modeled grade; neither is a grade-specific sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace material realization supplies a price-scale input, with modeled year and product-mix adjustments. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization calibrates the assumed blended material price, not this grade's observed revenue. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace realization and discussion of xx.xx commercial traction support the price and adoption premises; the allocation remains modeled. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Aerospace realization provides a shared monetary comparison for the assumed grade price. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported eight-to-ten-year aerospace application-introduction periods constrain interpretation of the seven-year adoption forecast. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported aerospace application-introduction periods provide an adoption-delay counterweight, not a forecast sales observation. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hayn-20230930x10k.htm))
53. European Commission CORDIS - Welding Metallurgy and Cracking in Superalloys: Reporting
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The historical all-sector tonnage discussion is only a dominance cross-check; it cannot establish current aerospace monetary share. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies 718Plus separately from ordinary xx.xx supporting identity separation without supplying a current sales weight. ([cordis.europa.eu](https://cordis.europa.eu/project/id/xx.xx/reporting/it))
54. Special Metals - Alloy Surcharge Report
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: August-October 2026 grade surcharges provide a differentiated cost-exposure check, not full invoice prices or observed 2032 prices. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The xx.xx surcharge sequence independently qualifies a uniform price assumption; it is not substituted for a material selling price. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The grade-specific surcharge listing is a commercial cost comparison, not an observed Global grade realization. ([specialmetals.com](https://www.specialmetals.com/services/prior-month-adjuster.html))

55. Cannon-Muskegon - Safety Data Sheet: Nickel Alloy Castings

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current-and-past supplier identity mapping only; not proof of 2025 aerospace sales or the modeled volume. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: CMSX-xx.xx is separately identified; the material-value weight remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current sales are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713C is listed separately from IN-713LC; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-713LC is listed separately from IN-713C; no quantitative split is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx identity mapping only; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-738LC is separately identified; the aerospace-attribution fraction is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx category mapping only; current aerospace tonnes are not disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: IN-xx.xx appears in a current-and-past identification list; this does not establish recurring aerospace production sales. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: MAR-M xx.xx is identified separately from CM247LC; monetary weights remain modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PWA xx.xx is separately identified; no attributable sales value is disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; current commercial scale remains assumed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Rene xx.xx identity mapping only; no current grade-specific material sales are disclosed. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Udimet xx.xx appears in the supplier's current-and-past identities; aerospace attribution is modeled. ([cannonmuskegon.com](https://www.cannonmuskegon.com/documents/sds-nickel-alloy.pdf))

56. GE Aerospace - Safety First: A Retiring GE Aerospace Materials Engineer Made Protecting Lives His Mission
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer separately describes Rene xx.xx and its commercial-volume rationale; this supports category mapping, not an observed grade share. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer associates Rene 88DT with GE90 application history, supporting an installed-program demand premise without disclosing current material purchasing. ([geaerospace.com](https://www.geaerospace.com/news/articles/people/safety-first-retiring-ge-aerospace-materials-engineer-made-protecting-lives-his))
57. Aubert & Duval - AD730: Ni-Based Superalloy for High Temperature Applications
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supplier aerospace application and cost positioning support the category and relative-price premise; neither current sales nor the forecast adoption factor is disclosed. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2025/xx.xx/AD730-superalloy-2024-xx.xx.pdf))
58. University of Portsmouth - Improved Creep-Fatigue-Oxidation Resistance in Gas Turbine Disc Materials: REF Impact Case Study
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies RR1000 in Rolls-Royce engine applications; it supports commercial exposure, not the assumed annual material volume. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Institutional evidence identifies U720Li in Rolls-Royce engine applications; it supports commercial exposure, not a current sales split. ([ref2014impact.azurewebsites.net](https://ref2014impact.azurewebsites.net/casestudies2/refservice.svc/GetCaseStudyPDF/xx.xx))

59. Influence of Long Term Exposure in Air on Microstructure, Surface Stability and Mechanical Properties of UDIMET 720LI

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The aerospace-industry publication distinguishes conventional Udimet xx.xx from its 720Li derivative; it does not establish a current monetary allocation. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The publication independently supports the 720Li identity and aircraft-engine-disc category, without supplying current sales. ([tms.org](https://www.tms.org/Superalloys/xx.xx/2000/Superalloys_2000_487_493.pdf))

60. NASA Contractor Report 174639 - Literature Survey on Oxidations and Fatigue Lives at Elevated Temperatures

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Historical institutional material identification is a legacy-category anchor only; it does not demonstrate current aerospace material sales. ([ntrs.nasa.gov](https://ntrs.nasa.gov/api/citations/xx.xx/downloads/xx.xx.pdf))

61. America Makes - 5566.002 Proliferation of Nickel Superalloy Material Datasets for Powder Bed Fusion Additive Manufacturing

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The disclosed USD xx.xx project budget is the observed spending-scale primitive for an explicitly assumed material-budget, annualization, aerospace-attribution and coverage bridge. It is not powder revenue; its development stage also constrains the forecast starting point. ([americamakes.us](https://www.americamakes.us/projects/xx.xx-xx.xx-proliferation-of-nickel-superalloy-material-datasets-for-powder-bed-fusion-additive-manufacturing/))

62. GE Aerospace - Fourth Quarter 2025 Earnings Presentation

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported 2025 commercial-engine delivery growth supplies a near-term demand cross-check, not a grade-specific purchasing or seven-year growth observation. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Aggregate commercial and defense delivery growth constrains the commercial-demand scenario without establishing this grade's attributable consumption. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported defense-engine delivery growth is a demand-exposure check only; the PWA xx.xx activity factor remains assumed. ([geaerospace.com](https://www.geaerospace.com/sites/default/files/geaerospace_webcast_presentation_01222026_00_1.pdf))

19. Competitive Landscape

19.1. Market Share Analysis, 2025

[redacted] An incumbent's defensible position is therefore the accepted and deliverable relationship, not brand recognition alone. An entrant should first establish which customer controls approval and whether an authorized alternative can satisfy the same purchasing obligation.

[redacted] The choice is not simply producer versus distributor: buyers should select the relationship that covers their accepted material, allocation, records, and release needs. A channel partner can improve local administration, but cannot independently create customer authorization or an upstream material commitment.

United Performance Metals, TW Metals, ASM Aerospace Specification Metals, American Special Metals, Corp., Alloys International, Inc., High Performance Alloys, Inc., and Mega Mex provide additional catalog or specialty-material routes with different stated forms and services. [redacted] ASA Alloys additionally requires its exact aerospace grade-form and selling obligation established before a country-facing catalog becomes an executable option.

Latin American channels illustrate the distinction between local commercial access and accepted material availability. REALUM advertises an Inconel xx.xx route, Madiba Metals lists nickel alloys including xx.xx and xx.xx and Roberto Cordes S.A. maintains an Inconel xx.xx product entry. [redacted]

European distribution adds further choice without necessarily adding independent upstream production. [redacted] A

geographically broader network is useful only when the required offering and accountability extend to the relevant location.

Turkey presents several different commercial roles. ■■■■ ■■■■ ■■■■■■■■■■■■■■■ ■■■■ ■■■■■■■■■■ ■■ ■■■ ■■■■■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■ ■■■■■■■ ■■■ ■■■■ ■■■■■■■■■■ ■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■ ■■■■■■■■■ ■ ■■■■■■■■■■■■■■■ ■■■■■■■■■ ■■■■■ ■■■■■■■■■■ ■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■■■ ■■■ ■■■■■ ■■■■■■■■■■ ■■■■■■■ ■■■■■■■ ■■■ ■■■■■ ■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■■■■ ■■■ ■■■■■■ ■■■■■■■■■■■■ ■■ ■■ ■■■■■■■ ■■ ■ ■■■■■■■■ ■■■■■■ ■■■■■■ ■■■■■■ ■■■ ■■■■■ ■■■■■■■■ ■■■■■■■■■ ■■ ■■ ■■■■■■■■■ ■■■■■■■■■■■■ ■■ ■■■■■ ■■ ■■■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■■■ A direct supplier route remains preferable when the local intermediary cannot establish the required authorization and fulfillment responsibility.

GCC-oriented advertising provides additional discovery but not a transferable aerospace purchasing record. Nifty Alloys LLC and Icon Steel present nickel-alloy offerings; Project Steels & Piping DMCC advertises a Dubai-to-Qatar route; and Steelinox markets high-temperature alloys for UAE and Asian customers. ■■ ■■■■■■ ■■■■■■■ ■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■■■■■ ■■■■ ■■■■■■■■■ ■■■■■ ■■■■■■■■■■■■ ■■■■■■ ■■ ■■■■■■■■■ ■■■ ■■■■■■■ ■■■■■ ■■ ■■■ ■■■■■■■■ ■■■■■ ■■■■■■ ■■■■■■ ■■ ■■■■■■■■■■■■ ■■■■■ ■■■■ ■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■ ■■■■■■■ ■■ ■■■ ■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■

Other regional channels require the commercial role itself clarified. Novametal Middle East presents nickel-alloy wire, Nickel Alloy Metals & Machinery W.L.■■ ■■■■■■■■■ ■ ■■■■■■■■■■■■■■■■■ ■■■■■■■■■ ■■■ ■■■■■■ ■■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■ ■■■■■■■■■ ■■ ■■■■■ ■■■■■■■■■■ ■■■ ■■■ ■■■■■■■■■■■■ ■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■■■■■ ■■ ■ ■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■■■■■■ ■■ ■■■■■■■■■ ■■■■■■■ ■■■■■■■ ■■■■■■■■■ ■ ■■■■■■■■■ ■■■■■■■■■ ■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■ ■■■■■■■■■ ■■■ ■■■■■ ■■■■■■■■ ■■■■■■■■■■■■■■■

Scope Metals Group and B&S Aircraft Alloys present aerospace distribution propositions, but the exact current nickel-superalloy offer and contracting entity must still be identified. In African sourcing inquiries, Metalyns advertises nickel-alloy delivery coverage, while Multi Alloys requires the particular accepted material and seller obligation to be confirmed. ■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■■■ ■■■■ ■■■■■■■ ■■ ■■■ ■■■■■■■■■ ■ ■■■■■■■ ■■■■■■■■■■■ ■■■■■■■■■ ■■ ■■■■■■■■ ■■■■■■ ■■ ■■■ ■■■■■■■■■■■■ ■■■■■ ■■■■■■ ■■■■■■■■■■■ ■■■■■■■ ■■■ ■■■■■■■■■■■ ■■■■ ■■■■ ■■■■■■■■■■■ ■■■ ■■■ ■■■■■■■■ ■■■■■■■■■■■■

In Southeast Asia and Oceania, HH Special Metal describes a distribution business, Revolution Materials advertises sourcing selected nickel-alloy grades and forms, and Austral Wright Metals presents a high-performance-alloy catalog. ■■■■■ ■■■■■■■■■■■■ ■■■ ■■■ ■■■ ■ ■■■■■■ ■■■ ■■■ ■■■■■■ ■■■■■■■ ■■■ ■■■■■ ■■■■■■■ ■■■■■■■■■ ■■■■■ ■■■ ■■■■■■■■■ ■■■■■■■■■■■■■■■ ■■■■■■■■■■■■ These are additional account-access routes, not evidence that every advertised grade is locally held or eligible for the same program.

For Nasir Nickel Alloys, IKT - ITHRA AL-KHUBRA, Hassan Sheets and Plate, and Ashraf Nickel Alloys, the unresolved registered seller and attributable aerospace-material offer prevent a defensible comparison of commitments. ■■■ ■■■■ ■■■■■■ ■■■■ ■■■■ ■■■■■ ■■■■■■■■■ ■■■■ ■■■ ■■■■■ ■■■■ ■■■■ ■■■■■ ■■■■■ ■■■■■■ ■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■■■■

[illegible] These limitations concern the ability to compare an executable transaction; they establish neither absence nor low competitive significance.

Figure 32. Global Nickel-Based Superalloys for Aerospace Market Share, by Key Player, 2025

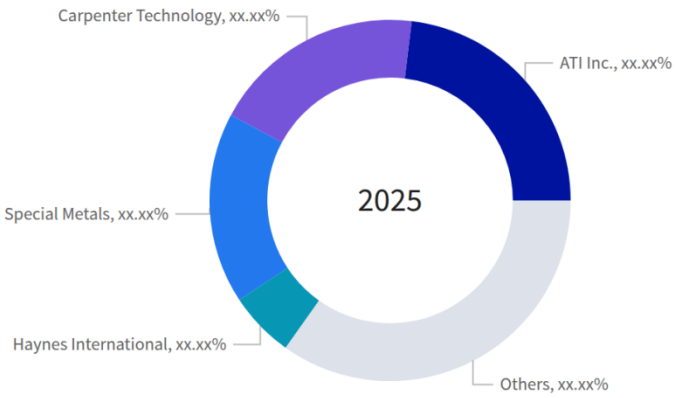

Table 568. Global Nickel-Based Superalloys for Aerospace Market Share, by Key Player, 2025

Key Player	Share (%)
6K Additive	xx.xx
Alleima	xx.xx
AMETEK Specialty Metal Products	xx.xx
Aperam S.A.	xx.xx
ATI Inc.	xx.xx
Aubert & Duval	xx.xx
Cannon-Muskegon	xx.xx
Carpenter Technology Corporation	xx.xx
Daido Steel Co., Ltd.	xx.xx
Doncasters	xx.xx
Fushun Special Steel	xx.xx
Haynes International, Inc.	xx.xx
Howmet Aerospace Inc.	xx.xx
Jiangsu Longda Superalloy Co., Ltd.	xx.xx
Jiangsu ToLand Alloy Co., Ltd.	xx.xx
Oerlikon Metco	xx.xx
SeAH Changwon Integrated Special Steel Corporation	xx.xx
Special Metals Corporation	xx.xx
VDM Metals	xx.xx
voestalpine BÖHLER Edelstahl GmbH & Co KG	xx.xx
Wedge Industrial Co., Ltd.	xx.xx
Western Superconducting Technologies Co., Ltd.	xx.xx
Xi'an Bright Laser Technologies Co., Ltd.	xx.xx
Zhonghe Shangda Aeronautic Materials Co., Ltd.	xx.xx
Others	xx.xx

Sources & Evidence

1. Special Metals - Aerospace
   - The advertised aerospace portfolio supports supplier discovery, without establishing permission to substitute material under a customer's contract. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
   - Evidence informing base-year company-share estimates: Aerospace alloy offerings establish the commercial product boundary, without establishing current grade-specific sales or customer acceptance.
2. Rolled Alloys - E-Services Stocking Programs
   - Rolled Alloys publishes stocking and release arrangements, including programs requiring contractual terms. ([rolledalloys.com](https://www.rolledalloys.com/eservices/))

3. Boeing BDS Terms and Conditions Guide - D607 Material Substitution Prohibition
   · Boeing D607 prohibits unauthorized substitutions, recognizes authorized alternatives, and makes permitted deviations purchase-contract-specific. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
4. Haynes International - Sales and Service
   · Haynes describes North American service centers, wholly owned European affiliates, and on-demand delivery support. ([haynesintl.com](https://haynesintl.com/en/sales-and-service/))
5. About Rolled Alloys
   · Rolled Alloys' international route includes NeoNickel representation in Europe, supporting a geographically differentiated channel comparison. ([rolledalloys.com](https://www.rolledalloys.com/about-us/))
6. Advanced Materials for Aerospace Motor & Engines - Carpenter Technology
   · Named engine-material offerings establish a sourcing comparison, not customer authorization for every proposed purchase. ([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))
7. United Performance Metals - Product Catalog
   · United Performance Metals' product catalog includes aerospace nickel-grade families such as Waspaloy, C263, and Rene xx.xx. ([upmet.com](https://www.upmet.com/products))
8. ASM Aerospace Specification Metals - Nickel-Alloy Distributor
   · ASM maintains an aerospace nickel-alloy distribution catalog containing named superalloy offerings. ([aerospacemetals.com](https://www.aerospacemetals.com/nickel-alloy-distributor/))
9. American Special Metals - Inconel 718
   · American Special Metals advertises Alloy xx.xx in multiple forms including plate, sheet, bar, and tube. ([americanspecialmetals.com](https://www.americanspecialmetals.com/inconelalloy718.html))
10. Alloys International - Industries Served
    · Alloys International's industry page presents aerospace material supply and identifies Inconel xx.xx and Waspaloy among frequently supplied materials. ([alloysintl.com](https://alloysintl.com/industries))
11. High Performance Alloys - Alloy 718
    · High Performance Alloys maintains a named Alloy xx.xx commercial product listing. ([hpalloys.com](https://www.hpalloys.com/alloys/xx.xx))
12. Mega Mex - Inconel Alloys
    · Mega Mex advertises nickel-alloy material supply including xx.xx xx.xx and HX in multiple commercial forms. ([megamex.com](https://megamex.com/inconel/))
13. REALUM - Inconel 718
    · REALUM maintains an Inconel xx.xx commercial distribution page. ([realum.com.br](https://www.realum.com.br/inconel-xx.xx.php))
14. Madiba Metals - Níquel e suas Ligas
    · Madiba Metals' nickel-alloy catalog lists Inconel xx.xx and Inconel xx.xx. ([madibametals.com.br](https://www.madibametals.com.br/niquel-e-suas-ligas))
15. Roberto Cordes S.A. - Inconel 718
    · Roberto Cordes maintains an Inconel xx.xx product entry with aerospace application references. ([cordes.com.ar](https://www.cordes.com.ar/productos/niquel-y-sus-aleaciones/inconel/inconel-xx.xx))
16. ACNIS do Brasil - Aeroespacial
    · ACNIS do Brasil presents an aerospace supply proposition including nickel-alloy materials; the page does not allocate stock to a particular order. ([acnisdobrasil.com.br](https://acnisdobrasil.com.br/aeroespacial/))
17. Smiths Metal Centres - Nickel Based Alloys
    · Smiths Metal Centres publishes a nickel-alloy and superalloy stock range. ([smithmetal.com](https://www.smithmetal.com/nickel-alloys.htm))
18. Castle Metals Aerospace - Aerospace Material Supplier
    · Castle Metals Aerospace advertises a global aerospace material channel that includes nickel-alloy offerings. ([amcastle.com](https://www.amcastle.com/castle-metals-aerospace/))

19. NORM 3D - Nickel Alloys
    - NORM 3D's nickel-material page identifies an EOS distribution proposition and named EOS nickel powders. ([norm3d-solutions.com](https://norm3d-solutions.com/en/nickel-alloys/))
20. Hiperoy - Aerospace and Space Solutions
    - Hiperoy advertises nickel-alloy supply for aerospace and space applications. ([hiperoy.com](https://www.hiperoy.com/industries/aerospace-and-space))
21. Kuzp - Nickel Base Alloys
    - Kuzp publishes a nickel-base superalloy category with aerospace application references, without settling a particular order's offered grade. ([kuzp.com.tr](https://www.kuzp.com.tr/en/nickel-based-super-alloys))
22. AZOBEX - About
    - AZOBEX describes a powder-material business serving aerospace and other advanced industries; the company description does not establish a particular customer's accepted offer. ([azobex.com](https://azobex.com/en/about/))
23. Nifty Alloys - Nickel Alloys
    - Nifty Alloys advertises nickel-alloy products through its UAE-facing commercial page. ([niftyalloys.com](https://www.niftyalloys.com/products/nickel-alloys))
24. Icon Steel - Nickel Alloys
    - Icon Steel publishes a nickel-alloy offering including xx.xx; the advertising does not establish an individual aerospace delivery obligation. ([iconsteel.ae](https://iconsteel.ae/products/nickel-alloys))
25. Project Steels DMCC - Nickel Alloy Supplier Qatar
    - Project Steels & Piping DMCC advertises nickel-alloy supply from Dubai to Qatar, including an Alloy xx.xx proposition. ([projectsteels.com](https://www.projectsteels.com/nickel-alloy-supplier-qatar.html))
26. Steelinox - High Temperature Nickel Alloys for UAE and Asia
    - Steelinox markets high-temperature nickel alloys for UAE and Asian customers; the offered territory does not establish an order-specific aerospace acceptance. ([steelinox.nl](https://www.steelinox.nl/en/information/stainless-steel-supply-for-uae-asia/high-temperature-alloys))
27. AL LIWARA General Trading LLC - High Nickel Plates & Sheets
    - AL LIWARA General Trading LLC advertises high-nickel plates and sheets. ([liwaraenergy.com](https://www.liwaraenergy.com/High-Nickel-Plate-Sheets.html))
28. Novametal Middle East - Nickel Alloys Regular and Fine Wire
    - Novametal Middle East publishes a nickel-alloy regular and fine-wire offering. ([novametalmetrading.com](https://novametalmetrading.com/nickel-alloys-regular-and-fine-wire/))
29. Nickel Alloy Metals & Machinery - About
    - Nickel Alloy Metals & Machinery describes a specialty-material business and regional commercial coverage. ([nickelalloyme.com](https://nickelalloyme.com/about/))
30. Nickel Marketing Consultancy - Alloy Portfolio
    - Nickel Marketing Consultancy publishes an alloy portfolio, including a high-temperature xx.xx reference; the page does not settle whether it accepts material-selling obligations. ([nickelmarkets.com](https://nickelmarkets.com/alloys.html))
31. Scope Metals Group - Aerospace Materials Catalogue
    - Scope's aerospace catalog presents a distribution proposition that includes nickel alloys, without settling the exact current order-specific subset. ([scope.co.il](https://www.scope.co.il/wp-content/uploads/2021/xx.xx/Scope_Aerospace_Materials_Catalogue_EN-xx.xx.pdf))
32. B&S Aircraft Alloys - Aerospace-Grade Raw Materials
    - B&S Aircraft Alloys presents aerospace raw-material distribution and direct mill relationships. ([bsaa.com](https://www.bsaa.com/raw-materials))
33. Metalyns - Alliages de Nickel
    - Metalyns advertises nickel-alloy products and delivery coverage into North Africa; this is an offered route rather than proof of a particular aerospace transaction. ([metalyns.be](https://metalyns.be/alliages-de-nickel/))

34. HH Group - HH Special Metal
    - HH Group describes HH Special Metal as a distribution business serving aerospace and other markets, without establishing an exact nickel-superalloy order. ([honghock.com.sg](https://www.honghock.com.sg/hh-special-metal/))
35. Revolution Materials - Nickel Alloys
    - Revolution Materials advertises sourcing selected aerospace nickel-alloy grades and material forms. ([revolutionmaterials.com.au](https://www.revolutionmaterials.com.au/nickel.php))
36. Austral Wright Metals - Nickel Alloys & High Performance Alloys Datasheet
    - Austral Wright Metals publishes a nickel and high-performance-alloy catalog with aerospace application references. ([australwright.com.au](https://www.australwright.com.au/alloys-datasheet/))
37. ATI Inc. - 2025 Form 10-K
    - Evidence informing base-year company-share estimates: Fiscal-2025 segment sales, nickel/specialty product percentages and separately classified component activity anchor the modeled material-only numerator; purchase-order recognition distinguishes realized activity from framework agreements.
38. Carpenter Technology Corporation - 2025 Form 10-K
    - Evidence informing base-year company-share estimates: Fiscal-2025 aerospace-and-defense revenue of USD xx.xx supplies the annual input to the calendar-2025 bridge, not a directly observed nickel-material numerator.
39. Carpenter Technology Corporation - Form 10-Q for December 31, 2025
    - Evidence informing base-year company-share estimates: Six-month aerospace-and-defense revenue of USD xx.xx and USD xx.xx for periods ended December 2024 and 2025 enables an actual calendar-period bridge.
40. Precision Castparts Corp. - Fiscal 2015 Form 10-K
    - Evidence informing base-year company-share estimates: Historical Forged Products intercompany activity of USD xx.xx constrains a material-linkage allocation proxy; the filing includes mixed products and does not disclose current Special Metals aerospace revenue.
    - Evidence informing base-year company-share estimates: Historical casting intercompany activity of USD xx.xx and aerospace sales of USD xx.xx out of USD xx.xx constrain a distinct casting-material proxy.
    - Evidence informing base-year company-share estimates: Additional internal ingot operations prevent assigning all PCC casting-material activity automatically to Cannon-Muskegon.
41. Precision Castparts Corp. - About PCC
    - Evidence informing base-year company-share estimates: PCC identifies Special Metals' forging-billet supply role, supporting separate material attribution rather than counting downstream forging revenue.
    - Evidence informing base-year company-share estimates: PCC identifies Cannon-Muskegon's casting-alloy role and common ownership; this supports role separation, not its modeled monetary weight.
42. Cannon-Muskegon - Our Company
    - Evidence informing base-year company-share estimates: The company's nickel-base casting-alloy business supports its commercial classification; the portfolio is not treated as a revenue observation.
43. Acerinox - Results Report, Fiscal Year 2025
    - Evidence informing base-year company-share estimates: Combined 2025 high-performance-alloys finishing production of xx.xx metric tons anchors the shared material budget; integration reporting supports common-control treatment.
    - Evidence informing base-year company-share estimates: The same combined production anchor constrains VDM's allocation without adding the parent division again; aerospace attribution, realization and company split remain modeled.
44. Haynes International, Inc. - 2023 Form 10-K
    - Evidence informing base-year company-share estimates: Fiscal-2023 aerospace revenue of USD xx.xx supplies a historical company-specific relative allocation weight, not observed 2025 revenue.
    - Evidence informing base-year company-share estimates: Haynes' historical aerospace revenue supplies the counterpart weight in the jointly constrained Haynes/VDM allocation.

45. Acerinox - Fiscal Year 2023 Results
- Evidence informing base-year company-share estimates: Pre-acquisition 2023 high-performance-alloys finishing production supplies the VDM counterpart primitive used to allocate the shared group budget.
- Evidence informing base-year company-share estimates: The xx.xx-ton 2023 finishing quantity anchors VDM's historical relative weight; its aerospace fraction and monetary realization are assumptions.

46. Competition and Markets Authority - Acerinox/Haynes Full Text Decision, 2024
- Evidence informing base-year company-share estimates: Original customer responses identify Special Metals as an external alternative while noting offering limitations; research-derived market-share tables are excluded.
- Evidence informing base-year company-share estimates: Original customer evidence differentiates Haynes' aerospace positioning from VDM's broader flat-product business, supporting heterogeneous allocation assumptions.
- Evidence informing base-year company-share estimates: Customer reports of weaker aerospace positioning and some approval limitations challenge a high universal VDM aerospace attribution; period, form and territory limitations are retained.

47. VDM Metals - Aerospace
- Evidence informing base-year company-share estimates: The current aerospace portfolio identifies semi-finished material supply for engine applications, qualifying any inference of complete absence from aerospace; it does not measure sales.

48. DPC Holdings Limited - Draft Registration Statement, April 14, 2026
- Evidence informing base-year company-share estimates: Reported 2025 aerospace revenue of USD xx.xx anchors the numerator.
- Evidence informing base-year company-share estimates: External superalloy supply and the disclosed xx.xx% internal-sourcing relationship support distinct external and captive material bridges, while conflicting with the frozen xx.xx% assumption.

49. DPC Holdings Reports Strong Second Quarter 2026 Results
- Evidence informing base-year company-share estimates: The August xx.xx 2026 customer-backed Alabama investment announcement is treated as development context, not 2025 recognized material sales.

50. Aubert & Duval - October 2025 Press Dossier
- Evidence informing base-year company-share estimates: Reported EUR xx.xx of 2024 business revenue anchors company scale.
- Evidence informing base-year company-share estimates: The integrated multi-material and finished-product portfolio requires explicit aerospace, nickel and terminal-material valuation adjustments.

51. Alloyed - About and Company History
- Evidence informing base-year company-share estimates: The licensor records a 2019 ABD agreement with Aubert & Duval; the model does not treat that relationship as quantified powder sales, unrestricted rights or an incremental revenue premium.

52. Über BÖHLER - voestalpine BÖHLER Edelstahl
- Evidence informing base-year company-share estimates: The operating-company profile reports EUR xx.xx annual revenue without identifying the accounting year; it supplies a period-qualified scale anchor, not observed 2025 aerospace nickel sales.

53. voestalpine Annual Report 2025/26 - High Performance Metals Division
- Evidence informing base-year company-share estimates: The fiscal-2025/xx.xx divisional customer mix identifies xx.xx% aerospace revenue, used only as a proxy for the assigned operating company's aerospace exposure.

54. Aperam - Full Year and Fourth Quarter 2025 Results
- Evidence informing base-year company-share estimates: Alloys & Specialties revenue was EUR xx.xx in 2025 and EUR xx.xx in 2024; these broader segment anchors constrain the modeled legacy/acquired pools but do not disclose eligible nickel sales.

55. Universal Stainless Announces Completion of Its Acquisition by Aperam
    - Evidence informing base-year company-share estimates: The January xx.xx 2025 completion announcement establishes Universal Stainless within Aperam's ownership perimeter; it does not measure the acquired operation's nickel-superalloy revenue.
56. Oerlikon Annual Report 2025 - Revenue Disaggregation
    - Evidence informing base-year company-share estimates: The revenue note reports CHF xx.xx of aviation revenue in 2025 and CHF xx.xx in 2024; the model separately removes nonmaterial and out-of-scope consideration.
57. Oerlikon Metco - MetcoAdd and MetcoMed Powder Portfolio
    - Evidence informing base-year company-share estimates: The commercial portfolio identifies MetcoAdd nickel-superalloy powder offerings and aerospace applications, supporting the product bridge but not the assumed revenue fractions.
58. Daido Steel - Segment Data
    - Evidence informing base-year company-share estimates: March-2025/March-2026 segment sales are JPY xx.xx/xx.xx for HPM and magnetic materials and JPY xx.xx/xx.xx for automobile and industrial parts; these constrain the fiscal-to-calendar model.
59. Daido Steel Group Integrated Report 2025
    - Evidence informing base-year company-share estimates: The report identifies superalloy commercial forms and mixed end uses, while treating expanded large-rotating-part certification as a future objective; investment and targets are not counted as 2025 sales.
60. Jiangsu ToLand Alloy Co., Ltd. - 2025 Annual Report
    - Evidence informing base-year company-share estimates: The filing separately reports 2025 casting-superalloy, wrought-superalloy and small/medium-component revenues of CNY xx.xx, xx.xx and xx.xx, supporting distinct material and component attribution.
61. Western Superconducting Technologies Co., Ltd. - 2025 Annual Report
    - Evidence informing base-year company-share estimates: The consolidated filing reports CNY xx.xx of high-performance superalloy revenue and xx.xx tonnes sold in 2025, separately from titanium and superconducting products.
    - Evidence informing base-year company-share estimates: Reported superalloy revenue growth of xx.xx% establishes broader realized commercial activity, not a grade-specific aerospace sales percentage.
62. Western Superconducting Technologies - High-Performance Superalloys
    - Evidence informing base-year company-share estimates: The official catalog connects GH3536 with nickel-based high-temperature material and aircraft-engine applications; it supports product eligibility, not the modeled aerospace or nickel revenue fractions.
63. 抚顺特殊钢股份有限公司 2025 年年度报告
    - Evidence informing base-year company-share estimates: The 2025 annual report provides CNY xx.xx superalloy revenue, its xx.xx% decline, and mixed aerospace/non-aerospace product boundaries; the final nickel-aerospace allocation is modeled. ([dataclouds.cninfo.com.cn](https://dataclouds.cninfo.com.cn/shgonggao/hsomarket/2026/xx.xx/58b4e684255c46c69bd844e2edcfc4a3.PDF))
64. Alleima - Annual Report 2025
    - Evidence informing base-year company-share estimates: The 2025 report provides SEK xx.xx of Tube transportation revenue and describes a mixed aerospace/automotive and material portfolio; this anchors, but does not directly observe, the modeled numerator. ([alleima.com](https://www.alleima.com/siteassets/documents/ir/2025-ar/alleima-annual-report-2025.pdf))
65. Alleima - Aerospace Tubes
    - Evidence informing base-year company-share estimates: The official aerospace tubing offering establishes eligible nickel-alloy participation, not its revenue proportion or customer-specific acceptance. ([alleima.com](https://www.alleima.com/en/products/tube-pipe//tubular-products/aerospace-tubes))

66. Howmet Aerospace Inc. - 2025 Form 10-K

· Evidence informing base-year company-share estimates: The filing reports USD xx.xx commercial-aerospace and USD xx.xx defense-aerospace Engine Products revenue and identifies alloy/billet operations. Material-value and own-sourcing coefficients remain assumptions. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/hwm-xx.xx.htm))

67. 6K Additive, Inc. - Annual Report 2025

· Evidence informing base-year company-share estimates: The annual report provides Powder revenue of USD xx.xx service-revenue accounting and the USD xx.xx over-time amount used in the product-only bridge. It also identifies aerospace and space customer activity; nickel and destination splits remain modeled. ([investorpa.com](https://investorpa.com/announcement-pdf/xx.xx/xx.xx.pdf))

68. 6K Additive and Cumberland Additive Announce Partnership and Sign Long Term Supply Agreement for Nickel 718

· Evidence informing base-year company-share estimates: The May xx.xx 2023 announcement establishes a named external Ni718 supply agreement, but not aerospace-only 2025 revenue or agreement volumes. ([6kinc.com](https://www.6kinc.com/news/press-release/6k-additive-and-cumberland-additive-announce-partnership-and-sign-long-term-supply-agreement-for-nickel-xx.xx/))

69. 6K Additive Partners with Agile Space Industries to Advance Mission to the Moon

· Evidence informing base-year company-share estimates: The August xx.xx 2023 announcement describes Ni625 qualification being pursued for Agile's application; it is not proof of completed acceptance or a quantitative sales weight. ([6kadditive.com](https://6kadditive.com/news/6k-additive-partners-with-agile-space-industries-to-advance-mission-to-the-moon/))

70. AMETEK Acquires Global Tubes

· Evidence informing base-year company-share estimates: AMETEK's May xx.xx 2015 announcement reports approximately USD xx.xx annual sales for Global Tubes, comprising Fine Tubes and Superior Tube. This is a historical business-scale anchor, not 2025 eligible revenue. ([news.cision.com](https://news.cision.com/ametek/r/ametek-acquires-global-tubes%2Cc9771747))

71. AMETEK Specialty Metal Products - Our Brands

· Evidence informing base-year company-share estimates: The business-unit portfolio identifies Fine Tubes and Superior Tube alongside other specialist metal brands, supporting consolidated attribution rather than treating the tube brands as independent parent competitors. ([ametekmetals.com](https://www.ametekmetals.com/ourbrands))

72. Fine Tubes - Aerospace

· Evidence informing base-year company-share estimates: The aerospace tube catalog supports nickel-alloy and form eligibility, but does not quantify the aerospace nickel revenue mix used in the estimate. ([finetubes.co.uk](https://www.finetubes.co.uk/markets/aerospace-tubes))

73. 江苏隆达超合金股份有限公司 2025 年年度报告

· Evidence informing base-year company-share estimates: The consolidated report provides CNY xx.xx aerospace revenue and CNY xx.xx superalloy revenue, with distinct non-aerospace end markets. Nickel and terminal-material retentions are modeled. ([static.cninfo.com.cn](https://static.cninfo.com.cn/finalpage/2026-xx.xx-xx.xx/xx.xx.PDF))

74. 中航上大高温合金材料股份有限公司-2025 年年度报告

· Evidence informing base-year company-share estimates: Reports 2025 high-temperature/high-performance-alloy revenue of CNY xx.xx, down xx.xx%, and separately identifies stainless-steel activity; anchors the modeled eligible-material numerator.

75. 中和上大航空材料股份有限公司-2026 年半年度报告

· Evidence informing base-year company-share estimates: Records completion of the corporate name change on May xx.xx 2026; supports continuity of the 2025 financial issuer with the captured current company identity.

76. 万泽实业股份有限公司-2025 年年度报告

· Evidence informing base-year company-share estimates: Separately reports CNY xx.xx of 2025 high-temperature-alloy material sales and CNY xx.xx of broader manufacturing revenue; supports excluding separately identifiable service consideration.

77. 万泽实业股份有限公司-2025 年年度报告摘要

· Evidence informing base-year company-share estimates: Identifies material and component businesses, supporting a separate external-material/captive-equivalent model rather than counting all component revenue as material.

78. 西安铂力特增材技术股份有限公司-2025 年年度报告

· Evidence informing base-year company-share estimates: Provides consolidated raw-material, customized-product, equipment and customer-market revenue anchors used in the powder and captive-material model; does not disclose nickel-only aerospace sales.

79. SeAH Besteel Holdings-2026 First-Quarter Report

· Evidence informing base-year company-share estimates: Comparative 2025 table reports Changwon standalone bar revenue of KRW xx.xx and total revenue of KRW xx.xx; supplies the product-line scale anchor, not an aerospace nickel-sales observation.

80. SeAH Besteel Holdings-2025 Third-Quarter Earnings Presentation

· Evidence informing base-year company-share estimates: Distinguishes Changwon nickel/titanium rolled and forged materials from American master-alloy and powder activity; supports entity and offering separation without treating announced expansion as 2025 sales.

19.2. Market Concentration Analysis, 2025

[redacted] Villares Metals S.A. identifies voestalpine High Performance Metals affiliation. Buyers pursuing corporate diversification should distinguish these relationships from separate plants, contracts, and customer approvals.

Integration can secure internal material coverage without proving that outside customers are excluded. [redacted] An outside buyer needs an attributable commitment; an entrant needs evidence that its proposed partner can actually supply the relevant account.

Intermediary competition and mill competition are separate sources of bargaining leverage. [redacted]

[redacted] Buyers seeking disruption resilience should identify the underlying producer as well as the contracting stockist.

Proprietary rights create offering-specific control rather than automatic market-wide exclusivity. [redacted] A prospective partner should establish the offering, territory, and permitted activity before committing; an ordinary material purchaser should not assume that buying powder also grants broader commercialization rights.

[redacted] SeAH Changwon Integrated Special Steel Corporation and SeAH Superalloy Technologies require group-aware comparison, while S-Tech Corp.'s disclosed investment relationship with Gloria Material Technology Corp. does not by itself settle current control. These distinctions matter when a buyer is diversifying ownership rather than simply adding commercial contacts.

Further independence conclusions remain conditional. The asset and legal-succession boundary between TEI Alloys Inc. and Varzene Metal is not sufficiently settled to assign historical facilities twice. [redacted]

Sources & Evidence

1. Rolled Alloys - E-Services Stocking Programs
   · The service arrangements support comparing fulfillment obligations separately from producer ownership. ([rolledalloys.com](https://www.rolledalloys.com/eservices/))
2. VDM Metals - Acerinox Completes the Acquisition of Haynes International
   · The November xx.xx 2024 announcement records Acerinox's completed Haynes acquisition and connects Haynes and VDM in its high-performance-alloys business. ([vdm-metals.com](https://www.vdm-metals.com/en/company/news-and-events/news-archive/single/acerinox-completes-the-acquisition-of-haynes-international))
3. Alloyed - About
   · The recorded license establishes a relationship-specific commercialization route but does not publish the complete grant. ([alloyed.com](https://alloyed.com/about))
4. CMA - Anticipated Acquisition by Acerinox, S.A. of Haynes International, Inc.: Full Text Decision
   · Original customer responses in the CMA's European flat-nickel-alloy investigation identify Special Metals and other alternatives while noting offering differences; this is not aerospace-program acceptance. ([assets.publishing.service.gov.uk](https://assets.publishing.service.gov.uk/media/67370ebb65b6c2f3313e5d39/__Full_text_decision___.pdf))

5. Precision Castparts Corp. | About
   - PCC describes Cannon-Muskegon's casting-feedstock role and Special Metals' forging-input role within its integrated business relationships. ([precast.com](https://www.precast.com/about/))
6. NASA Licenses 3D-Printable Superalloy to Benefit US Economy
   - NASA's co-exclusive structure is a documented counterexample to treating an aerospace-material license as a sole commercial route. ([nasa.gov](https://www.nasa.gov/centers-and-facilities/glenn/nasa-licenses-3d-printable-superalloy-to-benefit-us-economy/))
7. AMETEK Specialty Metal Products - Our Brands
   - Fine Tubes is an operating brand within AMETEK Specialty Metal Products rather than an additional independent business-unit alternative. ([ametekmetals.com](https://www.ametekmetals.com/ourbrands))
8. About Rolled Alloys
   - Rolled Alloys describes NeoNickel as its exclusive European representative; this statement establishes representation, not equity ownership. ([rolledalloys.com](https://www.rolledalloys.com/about-us/))
9. Villares Metals - About Us
   - Villares identifies its Brazilian specialty-steel and alloy business and voestalpine High Performance Metals affiliation. ([villaresmetals.com.br](https://www.villaresmetals.com.br/en/company/about-us/))
10. IHI Master Metal - Products
    - The published external customer route provides a counterexample to assuming that an engine-affiliated material business is closed to outside buyers. ([ihi.co.jp](https://www.ihi.co.jp/imm/en/products/index.html))
11. United Performance Metals - O'Neal Industries and Affiliates
    - United Performance Metals identifies itself and TW Metals within the O'Neal Industries family. ([upmet.com](https://www.upmet.com/about/affiliates))
12. S-Tech Corp. - List of Major Shareholders
    - S-Tech's shareholder disclosure identifies an investment relationship with Gloria Material Technology Corp.; this dated record alone does not settle current control. ([s-tech.com.tw](https://www.s-tech.com.tw/en/a4-xx.xx-xx.xx/List-of-major-shareholders.html))
13. SeAH Group - Overseas Affiliates
    - SeAH Group identifies SeAH Superalloy Technologies within its overseas business structure, supporting group-aware comparison rather than assumed independence from other SeAH operations. ([seah.co.kr](https://www.seah.co.kr/eng/business/global))
14. Osprey Becomes an Independent Company with Strategic Agenda
    - The completed ownership transition changes corporate exposure without establishing another supplier alongside the legacy operation. This is the publication's identity-based commercial inference. ([ospreyatomiqs.com](https://www.ospreyatomiqs.com/newsroom/osprey-becomes-an-independent-company))
15. thyssenkrupp Aerospace Debuts Under Its New Name tk accelis Supply Chain Solutions
    - The announced legacy-name relationship does not establish another independent supplier. ([thyssenkrupp-materials-services.com](https://www.thyssenkrupp-materials-services.com/en/press-detail/thyssenkrupp-aerospace-debuts-under-its-new-name-tk-accelis-supply-chain-solutions-at-farnborough-international-airshow-xx.xx))

19.3. Recent Developments & Impact Analysis, 2025

Ownership changes alter sourcing independence before they establish any change in customer acceptance. ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪

[redacted] The transactions do not demonstrate automatic transfer of every approval or uniform allocation policies.

[redacted] For buyers, the immediate task is to align contractual and supplier-master identities without assuming that ownership change requires a material change. The commitment is evidence of intended continuity, not proof that every legacy grade is covered by every customer agreement.

The July xx.xx 2026 tk accelis announcement links the new Supply Chain Solutions identity with the business previously known as thyssenkrupp Aerospace. This changes how buyers recognize and administer the commercial relationship rather than creating another independent sourcing alternative. [redacted]

Portfolio withdrawal can narrow an alternative set despite continuing aerospace activity elsewhere in a business. [redacted] The disclosure is a category-specific withdrawal, not closure of Tekna's overall business.

Announced U.S. material projects should influence contingency planning without being counted as established supply commitments. [redacted] A commissioning or customer-acceptance milestone would change that conclusion; a catalog expansion alone would not.

Sources & Evidence

1. VDM Metals - Acerinox Completes the Acquisition of Haynes International
   · The completed acquisition changes parent-level sourcing exposure without establishing identical facility approvals or allocation policies. The latter distinction is the publication's bounded commercial inference. ([vdm-metals.com](https://www.vdm-metals.com/en/company/news-and-events/news-archive/single/acerinox-completes-the-acquisition-of-haynes-international))

2. Doncasters Group - DPC Holdings Reports Strong Second Quarter 2026 Results
   · Doncasters' August xx.xx 2026 results describe an aerospace-customer partnership supporting development of a new Alabama superalloy facility, not completed commercial operation. ([ir.doncasters.com](https://ir.doncasters.com/news-and-events/news/news-details/2026/DPC-Holdings-Reports-Strong-Second-Quarter-2026-Results/default.aspx))
3. Universal Stainless Announces Completion of Its Acquisition by Aperam
   · Universal Stainless announced completion of its acquisition by Aperam S.A. on January xx.xx 2025, and its resulting wholly owned subsidiary status. ([univstainless.com](https://www.univstainless.com/files/Universal-Stainless-Announces-Completion-of-its-Acquisition-by-Aperam.pdf))
4. Osprey Becomes an Independent Company with Strategic Agenda
   · Osprey's announcement was published October xx.xx 2026, is dated October xx.xx 2026, records Mimir's completed acquisition from Sandvik, and commits to continuity of existing contracts, orders, and qualified production lines. ([ospreyatomiqs.com](https://www.ospreyatomiqs.com/newsroom/osprey-becomes-an-independent-company))
5. Companies House - Osprey Atomiqs Limited
   · Companies House identifies active Osprey Atomiqs Limited and records Sandvik Osprey Limited as its previous name through October xx.xx 2026. ([find-and-update.company-information.service.gov.uk](https://find-and-update.company-information.service.gov.uk/company/xx.xx))
6. thyssenkrupp Aerospace Debuts Under Its New Name tk accelis Supply Chain Solutions
   · The July xx.xx 2026 announcement states that tk accelis Supply Chain Solutions encompasses the business previously known as thyssenkrupp Aerospace. ([thyssenkrupp-materials-services.com](https://www.thyssenkrupp-materials-services.com/en/press-detail/thyssenkrupp-aerospace-debuts-under-its-new-name-tk-accelis-supply-chain-solutions-at-farnborough-international-airshow-xx.xx))
7. Tekna Holding ASA - Annual Report 2024
   · Tekna's 2024 annual report states that it discontinued lower-margin nickel-alloy powder production in favor of titanium and aluminum products. ([live.euronext.com](https://live.euronext.com/sites/default/files/esg_document_files/2025-xx.xx/254189_Tekna%20Annual%20Report%xx.xx%20vF%xx.xx%28website%2C%20newsweb%29_2025-xx.xx-17_17%3A46.pdf))
8. SeAH Superalloy Technologies - Introducing Cast Ingot
   · SeAH's August xx.xx 2026 announcement introduces cast ingot, states that Temple is moving closer to production, and describes a non-captive business model. ([seahsuperalloys.com](https://www.seahsuperalloys.com/news/introducing-cast-ingot-expanding-seahs-superalloy-capabilities))

19.4. Product Portfolio Analysis, 2025

Nickel-Based Superalloys for Aerospace contains several procurement peer groups rather than one interchangeable supplier set. ATI Inc. combines aero-engine materials, powder superalloys, and downstream products; Carpenter Technology Corporation advertises engine materials including Alloy xx.xx and Waspaloy; and Special Metals Corporation presents a broader collection of recognized aerospace grade families. ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪ ▪▪▪ ▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪ ▪▪▪▪▪ ▪▪▪▪▪ ▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪ ▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪

[illegible] These businesses provide credible feedstock inquiries, but their offerings should not be substituted automatically for billets, precision strip, or powder. A casting customer should establish the authorized material designation and external supply commitment before using another supplier's wider catalog as a fallback.

Form specialization creates differentiation that grade counts obscure. [illegible] Specialist coordination can simplify accountability, but the original material source and customer acceptance remain separate requirements.

Branded producer routes also require offer-level matching. [illegible] Buyers should compare the quoted designation, form, documentation, and accepted source rather than select on the shared alloy-family reference.

[illegible] SeAH Changwon Integrated Special Steel Corporation lists aerospace material designations including N07718, while S-Tech Corp. advertises aerospace nickel-alloy ingots and round bars. Each adds an identifiable commercial inquiry, but destination delivery, the responsible seller, and customer acceptance must be established separately.

Powder portfolios overlap in familiar material identities while differing in business relationships. 6K Additive lists Ni718 and Ni625; Linde Advanced Material Technologies, Inc. advertises TRUFORM xx.xx xx.xx and xx.xx; and Avimetal AM Tech Co., Ltd. lists In718, In625, and Hastelloy X within its aerospace portfolio. [illegible]

Equipment-associated materials constitute another commercial model. EOS GmbH markets nickel powders associated with EOS systems and states that its powders ship with inspection certificates. ▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪ ▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪ ▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪

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Carpenter Technology Corporation, Elementum 3D, Inc., Linde Advanced Material Technologies, Inc., and Powder Alloy Corporation appear together in NASA's GRX-xx.xx co-exclusive licensing announcement. ▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ Buyers should assess the licensed proposition separately from an already accepted material offer, particularly where their purchasing timetable cannot accommodate unresolved customer acceptance.

Sources & Evidence

1. Special Metals - Aerospace
   - Special Metals lists recognized aerospace alloy families and named grades including xx.xx xx.xx X-xx.xx Udimet xx.xx and Waspaloy. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
2. Alloyed - About
   - Alloyed records a 2019 licensing agreement with Aubert & Duval over ABD. ([alloyed.com](https://alloyed.com/about))
3. Haynes International - Sales and Service
   - Haynes' official sales page links its branded high-temperature alloy portfolio with its service network. ([haynesintl.com](https://haynesintl.com/en/sales-and-service/))
4. ATI Aerospace Materials
   - ATI's aerospace page lists nickel- and cobalt-based materials, powder superalloys, forgings, castings, and components, supporting comparison at the material-versus-downstream-product level. ([atimaterials.com](https://www.atimaterials.com/markets/aerospace))
5. Doncasters Superalloys of Long Beach, CA, USA
   - Doncasters identifies its Long Beach operation as Certified Alloy Products Inc. and advertises master superalloys for aerospace applications. ([doncasters.com](https://www.doncasters.com/contact/location/doncasters-superalloys-of-long-beach-ca-usa))

6. 高性能高温合金 - 西部超导材料科技股份有限公司

   · Western Superconducting Technologies identifies GH3536 as a nickel-base high-temperature material for aircraft-engine combustion-chamber and additive-material applications. ([c-wst.com](https://www.c-wst.com/default/product_view/2023011015GmxRs.html))

7. Ulbrich - Aerospace Engine Components and High-Temperature Alloys

   · Ulbrich advertises nickel-based alloys in continuous precision strip and foil for aerospace products. ([ulbrich.com](https://www.ulbrich.com/applications/aerospace-engine-components-high-temp-alloys/))

8. Metal Powder for Additive Manufacturing - 6K Additive

   · 6K Additive's commercial powder portfolio names Ni718 and Ni625. ([6kadditive.com](https://6kadditive.com/metal-powder-for-additive-manufacturing/))

9. Linde AMT - Additive Manufacturing Powders

   · Linde AMT advertises aerospace-grade TRUFORM powders and lists nickel products xx.xx xx.xx and xx.xx. ([linde-amt.com](https://www.linde-amt.com/atomization/additive-manufacturing))

10. NASA Licenses 3D-Printable Superalloy to Benefit US Economy

    · NASA identifies Carpenter Technology Corporation, Elementum 3D, Linde Advanced Material Technologies, and Powder Alloy Corporation as co-exclusive GRX-xx.xx licensees permitted to produce and market the material. ([nasa.gov](https://www.nasa.gov/centers-and-facilities/glenn/nasa-licenses-3d-printable-superalloy-to-benefit-us-economy/))

11. AMETEK Specialty Metal Products - Our Brands

    · AMETEK Specialty Metal Products identifies Fine Tubes and Superior Tube within its brand portfolio. ([ametekmetals.com](https://www.ametekmetals.com/ourbrands))

12. Fine Tubes - Aerospace

    · Fine Tubes lists aerospace nickel tubing designations including Alloy xx.xx Alloy X750, Alloy xx.xx Alloy xx.xx and Alloy xx.xx. ([finetubes.co.uk](https://www.finetubes.co.uk/markets/aerospace-tubes))

13. Villares Metals - High Temperature Resistant

    · Villares separately lists VAT718 and VAT718QA in its high-temperature material catalog with aerospace gas-turbine applications. ([villaresmetals.com.br](https://www.villaresmetals.com.br/en/solutions-xx.xx/products/specialty-alloys/high-temperature-resistant/))

14. EOS - Nickel Alloys for Industrial 3D Printing

    · EOS markets nickel powders for its systems and states that they ship with inspection certificates under EN xx.xx Type xx.xx or Type xx.xx. ([eos.info](https://www.eos.info/metal-solutions/metal-materials/nickel-alloys))

15. SeAH CSS - Aerospace & Defense

    · SeAH Changwon's aerospace portfolio lists material designations including N07718. ([seahcss.co.kr](https://www.seahcss.co.kr/eng/application/aerospace.asp))

16. Advanced Materials for Aerospace Motor & Engines - Carpenter Technology

    · Carpenter's aerospace-engine portfolio identifies nickel-base xx.xx and Waspaloy offerings. ([carpentertechnology.com](https://www.carpentertechnology.com/aerospace/engines))

17. Cannon-Muskegon - Our Company

    · Cannon-Muskegon advertises nickel-base casting alloys serving aerospace and identifies CMSX-xx.xx among its proprietary offerings. ([cannonmuskegon.com](https://www.cannonmuskegon.com/about))

18. VDM Metals - Aerospace

    · VDM lists aerospace Alloy xx.xx and Alloy xx.xx and describes supplying pre-material for rotating and non-rotating engine parts. ([vdm-metals.com](https://www.vdm-metals.com/en/products-and-services/fields-of-application/aerospace))

19. IHI Master Metal - Products

    · IHI Master Metal advertises nickel- and cobalt-base superalloy ingots for aviation-engine turbine-blade casting and describes domestic and overseas customer supply. ([ihi.co.jp](https://www.ihi.co.jp/imm/en/products/index.html))

20. Alleima - Aerospace Tubes
    - Alleima's aerospace tubing page identifies Sanicro xx.xx as a nickel-based superalloy for aerospace engine, exhaust, and fluid-line applications. ([alleima.com](https://www.alleima.com/en/products/tube-pipe//tubular-products/aerospace-tubes))
21. BÖHLER L718AMS
    - BÖHLER maintains a named L718AMS product page identified with Alloy xx.xx. ([bohler-edelstahl.com](https://www.bohler-edelstahl.com/en/products/l718ams/))
22. Deutsche Nickel GmbH - Aerospace
    - Deutsche Nickel's aerospace page presents high-temperature nickel-alloy semifinished products and identifies aerospace alloy examples. ([deutsche-nickel.de](https://www.deutsche-nickel.de/en/key-markets/aerospace))
23. Proterial - MA-X
    - Proterial maintains an MA-X product listing within its aircraft and energy materials portfolio. ([proterial.com](https://www.proterial.com/e/products/aircraft_energy/heatresist/ma_x.html))
24. ToLand - Products
    - ToLand's portfolio distinguishes superalloy materials from aero-engine components and other products. ([en.toland-alloy.com](https://en.toland-alloy.com/products.html))
25. Longda - Company Profile
    - Longda's company profile identifies Jiangsu Longda Superalloy Co., Ltd. and connects its superalloy business with aero-engine applications. ([en.wxlongda.com](https://en.wxlongda.com/about.html))
26. S-Tech Corp. - Aerospace
    - S-Tech's aerospace catalog advertises nickel-alloy ingots and round bars, including recognized aerospace material designations. ([s-tech.com.tw](https://www.s-tech.com.tw/en/a2-xx.xx/Aerospace.html))
27. Avimetal - Aerospace
    - Avimetal's aerospace portfolio lists superalloy powders including In718, In625, and Hastelloy X. ([avimetaladditive.com](https://www.avimetaladditive.com/aerospace/))
28. Höganäs - 3D-Printed Aerospace Parts
    - Höganäs markets nickel-alloy powders within its aerospace additive-material offering. ([hoganas.com](https://www.hoganas.com/en/Industries/aerospace-turbines/3d-printing/))
29. FOMAS Group - MIMETE
    - FOMAS identifies MIMETE S.r.l., lists nickel-base powders, and includes aeronautics, space, and defense among its markets. ([fomasgroup.com](https://www.fomasgroup.com/en/global-presence/mimete))
30. Metalpine - Downloads
    - Metalpine's commercial download catalog lists nickel-alloy powder products including MET IN718. ([metalpine.at](https://metalpine.at/downloads/))
31. GKN Powder Metallurgy - Aerospace & Defense
    - GKN Powder Metallurgy advertises Ancor AM IN xx.xx and identifies aerospace applications. ([gknpm.com](https://www.gknpm.com/en/industries/aerospace-defense/))
32. Osprey - Metal Powders and Alloys
    - Osprey's materials page includes a nickel-superalloy powder category. ([ospreyatomiqs.com](https://www.ospreyatomiqs.com/materials))
33. 3D Systems - LaserForm Ni718 (A)
    - 3D Systems maintains a LaserForm Ni718 (A) material offer with aircraft-engine and rocket-component application references. ([3dsystems.com](https://www.3dsystems.com/materials/laserform-ni718))
34. Renishaw - Data Sheets: Additive Manufacturing
    - Renishaw maintains a commercial additive-material data-sheet catalog supporting its supplied-material role alongside equipment. ([renishaw.com](https://www.renishaw.com/tr/data-sheets-additive-manufacturing-xx.xx))

35. JX Advanced Metals - ABD-900AM New Nickel Powder for Additive Manufacture
    · JX Advanced Metals' product site promotes ABD-900AM and attributes the offering to Alloyed. ([nmmjx-dc.com](https://nmmjx-dc.com/en/products/3d_printer/abd900am.html))
36. AP&C - Ni Alloy 718
    · AP&C directly advertises a Ni Alloy xx.xx powder product. ([advancedpowders.com](https://www.advancedpowders.com/powders/titanium-aluminide/ni-xx.xx))
37. Morimura Bros., Inc. - AP&C Metal Powder Products
    · Morimura describes a sales-outlet relationship for AP&C powders in Japan and Korea. ([morimura.co.jp](https://www.morimura.co.jp/english/products/list/xx.xx.html))

19.5. Benchmarking Analysis, 2025

[illegible] EOS's inspection-certificate commitment illustrates a separate documentation criterion. Neither a general quality credential nor an attractive catalog entry settles every customer's purchasing requirement.

Contract coverage is a stronger commercial benchmark than relationship duration alone. ATI Inc.'s annual report distinguishes multiyear commercial terms from customer contracts typically established through accepted purchase orders. [illegible]

[illegible] For Howmet Aerospace Inc., Consolidated Precision Products, PBS Velká Bíteš, Transcrystal Alloy Industrial Corp., and Super Pioneer Technology LTD., an independently sold material-stock obligation must be distinguished from casting or component activity before treating the business as an equivalent material source. This distinction preserves their relevance to the aerospace ecosystem without transferring downstream capability into an unverified external material offer.

[illegible] For a material buyer, the unresolved question is who owns and sells the stock, not whether a business can handle an aerospace

alloy. For a material seller, such businesses may instead represent downstream account opportunities, subject to identifying their procurement authority.

General material and conversion businesses require a narrower aerospace intersection. Electralloy advertises nickel products to service centers, forgers, rerollers, and manufacturers, while Metalwerks, Inc. maintains a billet-and-bar offering. ■■■■■■■ ■■■■■■■■■ ■■■■■■■ ■■■■■■■ ■■■■■■■ ■■■■■■■ ■■■ ■■■■■■■ ■■■ ■ ■■■■ ■■■■■■■ ■■■■■ ■■■■■■■ ■■ ■■■■■ ■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■■■■■■■■ ■■■■■ ■■■■ ■■ ■■■ ■■■■■■■■■■■ ■■■■■■■■■ ■■■■ ■■■■■■■■■■■■ ■■■■■■■ ■■■■ ■■■ ■ ■■■■■ ■■■■■ ■■■ ■■■■■■■■ ■■■ ■■■ ■■■■■■■■■■■■■■■■■■■■■■■■■ ■■■■■■■■■■■■■ ■■■ ■ ■■■■■■■■■■ ■■■■■ ■■■■■■■ ■■■■■■■■ ■■■■■■■■■■ ■■ ■■■■■■■■■■■■ ■■■■■■■■ ■■■ ■■■■ ■■ ■■■■■■■■■■■■■ ■■■■■ ■■■■■■ ■■■■■■■■■ ■■■■■■■■■■■■■■ ■■■ ■■■■■■■ ■■■ ■■ ■■■■■■■■■■■■ ■■ ■■■ ■■■■ ■■■■■■■■■■

For Beijing Gangyan Gaona Keji Gufen Youxian Gongsi, Fushun Special Steel, Zhonghe Shangda Aeronautic Materials Co., Ltd., Wedge Industrial Co., Ltd., and Baowu Tezhong Yejin Youxian Gongsi, the decisive unresolved comparison is the exact nickel-base aerospace grade, form, and material-selling entity. ■■■■■ ■■■■■■■■■■■■ ■■■■■■■■■■ ■■ ■■■■■■■■■ ■■■■■■■■■ ■■■■■■ ■■■■■■■■■■ ■■■■■ ■■■■■■■■■■ ■■■■■■■■■■■■ Mishra Dhatu Nigam Limited, Aerolloy Technologies Limited, and Daido Steel Co., Ltd. likewise require current grade-form acceptance and an external delivery commitment to be matched to the intended application; a historical portfolio, development objective, or facility announcement is not a substitute.

■■■■■■■■ ■■■ ■■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■ ■■■■ ■■■■■■■ ■■■■■■■ ■■■■■ ■■■■■■■ ■■■■■■■■ ■■■■■■■ ■■■■■■■ ■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■ ■■■ ■■■ ■■■■■■■■■■■■■■ ■■■■■■■■ ■■■■■ ■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■■■■ ■■■■■■■■ ■■■■■■■ ■■■■ ■■■■■■■■ ■■ ■■■■■■■■ ■■■■■■■■■■■■ ■■ ■■■■■■■■■■■■■■ ■■■■■■■■■■■■ Nippon Yakin appears in the Competition and Markets Authority's flat-nickel-alloy customer evidence, but that does not establish acceptance for a particular aerospace superalloy requirement. For DNIPROSPETSSTAL, Ruspolymet, Metallurgicheskiy Zavod Elektrostal, and Stupinskaya Metallurgicheskaya Kompaniya, the unresolved material offer, contracting identity, and current delivery route prevent an interchangeable-source conclusion.

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Qualification-stage powder claims should be compared by the named customer and exact legal business, not transferred across affiliates or applications. This condition is particularly important for Continuum Powders and INDO-MIM Limited, and for powder inquiries involving Xi'an Bright Laser Technologies Co., Ltd., Xi'an Sino-Euro Materials Technologies Co., Ltd.,

Falcontech, and Guangzhou Sailong Additive Manufacturing Co., Ltd. ▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪ ▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪ ▪▪▪ ▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪

Dipti Metal Industries, Rolex Alloys International, Bhansali AeroAlloys LLP, and MSE Supplies LLC require confirmation of the powder or master-alloy principal, the actual seller, and the delivery obligation. ▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ These are conditions for comparing commercial obligations, not grounds for excluding an included Powder or Research, Development & Qualification purchase.

Precision-form comparisons also retain specific continuity questions. ▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ Repair-related wire participation should not be rejected categorically, but neither should a general consumable listing be treated as acceptance for every repair workscope.

Several regional inquiries remain seller-identification decisions before they become supplier comparisons. Dynamic Metals Ltd, Alinox, FFF Australia, Specialty Metals, and GMS Aços require an exact current business and aerospace nickel-material offer. ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪ ▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪ ▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪

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Gloria Material Technology Corp. requires its own current material offer to be separated from S-Tech Corp.'s catalog and disclosed investment relationship. Armco 2000 Group, Neith Metals, and Nabil Nickel Alloys require a named aerospace nickel-superalloy offer rather than separate references to aerospace and nickel products. ▪▪▪ ▪▪▪▪▪ ▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪

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Sources & Evidence

1. ATI 2025 Annual Report
   · ATI's 2025 annual report distinguishes multiyear agreements defining commercial terms from customer contracts typically established through accepted or acknowledged purchase orders. ([s27.q4cdn.com](https://s27.q4cdn.com/xx.xx/files/doc_financials/2025/ar/ATI-2025-Annual-Report-web-FINAL.pdf))
2. Rolled Alloys - E-Services Stocking Programs
   · Stocking-service descriptions support order-specific comparison of release administration rather than assumed material allocation. ([rolledalloys.com](https://www.rolledalloys.com/eservices/))
3. Boeing BDS Terms and Conditions Guide - D607 Material Substitution Prohibition
   · D607 supports benchmarking the authorized material relationship rather than assuming that a shared grade designation settles purchasing acceptance. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
4. Haynes International - Sales and Service
   · The producer-operated service proposition provides a fulfillment counterexample to assuming that local service requires an independent stockist. ([haynesintl.com](https://haynesintl.com/en/sales-and-service/))
5. CMA - Anticipated Acquisition by Acerinox, S.A. of Haynes International, Inc.: Full Text Decision
   · The CMA records Nippon Yakin among flat-nickel-alloy alternatives, which does not establish a named aerospace purchasing approval. ([assets.publishing.service.gov.uk](https://assets.publishing.service.gov.uk/media/67370ebb65b6c2f3313e5d39/___Full_text_decision___.pdf))
6. EOS - Nickel Alloys for Industrial 3D Printing
   · The published inspection-certificate commitment supports documentation as a distinct purchasing benchmark, not proof of every customer's acceptance. ([eos.info](https://www.eos.info/metal-solutions/metal-materials/nickel-alloys))
7. High Performance Alloys - Alloy 718
   · The named listing establishes an offering but does not settle production-versus-resale responsibility for a particular purchase. ([hpalloys.com](https://www.hpalloys.com/alloys/xx.xx))
8. FRISA - Superalloy Forgings
   · FRISA advertises nickel-superalloy forgings, supporting separation of the quoted forging obligation from a different material-stock purchase. ([frisa.com](https://www.frisa.com/en/materials/superalloys))
9. Scot Forge - Research & Development
   · Scot Forge identifies aircraft-quality material and aerospace forging activity, including an Alloy xx.xx reference. ([scotforge.com](https://www.scotforge.com/market-expertise/research-development))
10. Aero-Vac Alloys & Forge - Precision Machining Services
    · Aero-Vac advertises machining services involving aerospace materials and customer-supplied material, supporting the distinction between services and independent material-stock obligations. ([aerovacalloyforge.com](https://www.aerovacalloyforge.com/machine/))
11. Globo Usinagem - Solutions
    · Globo Usinagem describes aerospace solutions and machining-related supply, not a separately established material-stock contract. ([globousinagem.com.br](https://globousinagem.com.br/en/solutions/))
12. Pursuit Aerospace - Aerospace Engine Components
    · Pursuit Aerospace presents aircraft-engine component manufacturing, supporting the need to distinguish that role from an external material-selling obligation. (pursuitaero.com)

13. Electralloy - Product Focus: Nickel Bar
    - Electralloy advertises nickel products for aerospace and other markets and identifies service centers, forgers, rerollers, and manufacturers as customers. ([electralloy.com](https://www.electralloy.com/2022-news/xx.xx-product-focus-nickel-bar))
14. Metalwerks - Billet and Bar
    - Metalwerks publishes a billet-and-bar offering; that record does not by itself settle the exact current aerospace nickel-superalloy subset. ([metalwerks.com](https://www.metalwerks.com/products/mill-products/billet-and-bar/))
15. Swiss Steel Group - New Possibilities Through Additive Manufacturing and Optimized Metal Powders
    - Swiss Steel Group's dated announcement presents Printdur Ni625; the announcement does not establish every current aerospace purchasing condition. ([swisssteel-group.com](https://swisssteel-group.com/en/media/new-possibilities-through-additive-manufacturing-and-optimized-metal-powders))
16. Lattice Aerospace - Products & Applications
    - Lattice Aerospace's products-and-applications page describes powder categories and aerospace applications without establishing the exact customer-accepted nickel-superalloy offer needed for a like-for-like award comparison. ([latticeaerospace.com](https://latticeaerospace.com/products-applications))
17. CONUAR - Tubos de Aleaciones Avanzadas
    - CONUAR advertises advanced-alloy tubing for aerospace and other markets; the exact aerospace nickel-superalloy subset remains a separate purchasing question. ([conuar.ar](https://conuar.ar/tubos-de-aleaciones-avanzadas/))
18. Advanced Alloy Services - Superalloys
    - Advanced Alloy Services publishes a buy-and-sell superalloy portfolio containing named aerospace alloy families. ([advancedalloys.co.uk](https://www.advancedalloys.co.uk/superalloys/))
19. Advanced Revert - U.S. Joint-Venture Announcement
    - The public announcement names Advanced Revert LLC as a U.S. joint venture between Advanced Alloy Services Ltd. and Revert Alloys & Metals Ltd.; it does not establish present operating commitments. ([advancedrevert.com](https://www.advancedrevert.com/))
20. UJP PRAHA - Nickel Alloys
    - UJP PRAHA presents nickel-alloy development, research, and material services rather than establishing a recurring external material-stock obligation. ([ujp.cz](https://ujp.cz/en/offer/nickel-alloys))
21. S-Tech Corp. - List of Major Shareholders
    - The investment relationship does not transfer S-Tech's advertised materials to Gloria's own current portfolio. This is the publication's bounded attribution conclusion. ([s-tech.com.tw](https://www.s-tech.com.tw/en/a4-xx.xx-xx.xx/List-of-major-shareholders.html))

20. Company Profiles

20.1. ATI Inc.

ATI offers nickel-based aero-engine materials and powder superalloys alongside forgings, castings, and components. ■■■ ■■■■■■■■■■ ■■■■■■■■■■■ ■■ ■■■ ■■■■■■■ ■■ ■■■■■■■■ ■■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■ ■■■■■■■■■■■■ ■■■■■■ ■■ ■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■ ■■■■■■ ■■■■■■ ■■■■■■■■■■■■ ■■■■■■■ ■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■■■ ■■■■■■■ ■■■■ ■■■■■■■■■ ■■■■■■■ ■■ ■ ■■■■■■■■■ ■■■■■■■■■■ Capability in one part of that portfolio does not establish a commitment to supply another.

■■■■■ ■■■■ ■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■■■■■ ■■■■■■■■■■ ■■■■ ■■ ■■■■■■■■ ■■■ ■■■■■■ ■■■■ ■■■■■■■ ■■■■■■ ■■■■■■■ ■■ ■■■■ ■■■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■ ■■■■■■ ■■■■ ■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■ ■■■■■■■■ ■■ ■■■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■ Buyers can use the longer relationship for planning, but should tie delivery coverage to the accepted order, covered product, and agreed schedule. This preserves the benefit of continuity without treating a framework agreement as unconditional material allocation.

Sources & Evidence

1. ATI 2025 Annual Report
   - ATI's 2025 annual report identifies engine-material LTAs with GE Aviation and Safran that include nickel alloys, and says customer contracts are typically established through accepted or acknowledged purchase orders. ([s27.q4cdn.com](https://s27.q4cdn.com/xx.xx/files/doc_financials/2025/ar/ATI-2025-Annual-Report-web-FINAL.pdf))
   - Company verification: ATI's 2025 annual report establishes continuing nickel-superalloy and metallic-powder production for jet engines and identifies aircraft-engine manufacturer supply agreements.
2. ATI Aerospace Materials
   - ATI's aerospace portfolio lists nickel- and cobalt-based aero-engine products, powder superalloys, forgings, castings, and components, supporting the distinction between material and downstream-product offerings. ([atimaterials.com](https://www.atimaterials.com/markets/aerospace))
   - Company verification: ATI's aerospace portfolio lists nickel- and cobalt-based materials and powder superalloys for aero-engine applications.
   - Company verification: ATI states that its aerospace offering includes mill products, forgings, castings, and components.
3. Anticipated acquisition by Acerinox, S.A. of Haynes International, Inc. - Full text decision
   - Company verification: Original customer responses recorded by the CMA identify ATI as an alternative flat-nickel supplier.

20.2. Special Metals Corporation

■■■■■■■ ■■■■■■ ■■■■■■■■■■ ■■ ■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■ ■■■■■ ■■■■ ■■■■■ ■■■■ ■■■■■■ ■■■■ ■■■■■ ■■■■■■ ■■■■■■■ ■■■ ■■■■■■ ■■■■ ■■■ ■■■■■■■■■■ This gives buyers a broad grade-discovery route, but multiple brand or grade quotations from the company remain exposure to the same supplier group rather than independent corporate alternatives.

Precision Castparts identifies Special Metals within its Metals Group and describes its acquisition as supporting nickel-material independence for affiliated forging operations. ■■■■

[redacted] Those observations concern flat nickel alloys, not acceptance for every aerospace requirement.

[redacted] Where Boeing D607 governs, any proposed substitution must also meet its contract-specific authorization requirements. Special Metals is a defensible sourcing candidate, but portfolio familiarity does not eliminate offering-specific access checks.

Sources & Evidence

1. Special Metals - Aerospace
   - Special Metals' aerospace portfolio lists Alloy xx.xx Alloy xx.xx Alloy xx.xx Alloy X-xx.xx Nimonic xx.xx Udimet xx.xx and Waspaloy under its advertised alloy families. ([specialmetals.com](https://www.specialmetals.com/markets/aerospace.html))
   - Company verification: Special Metals' aerospace catalog lists INCONEL alloy xx.xx NIMONIC alloy xx.xx Waspaloy, and other aerospace alloys.
2. Boeing BDS Terms and Conditions Guide - D607 Material Substitution Prohibition
   - Where incorporated into a purchase contract, Boeing D607 prohibits unauthorized material substitutions while recognizing authorized alternatives and contract-specific deviations. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
3. CMA - Anticipated Acquisition by Acerinox, S.A. of Haynes International, Inc.: Full Text Decision
   - The CMA's 2024 flat-nickel-alloy assessment records original customer responses identifying Special Metals as an alternative, while reporting limitations in its production options or range. This evidence is not an aerospace-order approval. ([assets.publishing.service.gov.uk](https://assets.publishing.service.gov.uk/media/67370ebb65b6c2f3313e5d39/__Full_text_decision___.pdf))
   - Company verification: Original customer responses recorded by the CMA identify Special Metals as an alternative flat-nickel supplier.
4. Precision Castparts Corp. | Metals Products
   - Precision Castparts identifies Special Metals Corporation within its Metals Group, establishing the corporate relationship relevant to sourcing-diversification assessment. ([precast.com](https://www.precast.com/operations/metals-products.html))
   - Company verification: Precision Castparts identifies Special Metals Corporation within its Metals Group.
5. Precision Castparts Corp. | About
   - PCC describes acquiring Special Metals to support nickel-material independence for its forging businesses and identifies an intragroup billet-supply relationship. The profile does not extrapolate a present allocation policy. ([precast.com](https://www.precast.com/about/))
   - Company verification: PCC identifies Special Metals as its acquired nickel-material business supplying its forging operations.
   - Company verification: Special Metals and Cannon-Muskegon share PCC ownership but have distinguishable operating roles.

20.3. Haynes International, Inc.

Haynes combines named high-temperature material offerings with producer-operated fulfillment support. It markets Haynes xx.xx for applications including aeroengines, while its

sales network includes North American service centers and wholly owned European affiliates. ■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■ ■■■ ■■■■■■■ ■■■■■■■ ■■■■ ■■ ■■■■■■■■ ■■ ■■■■■■■ ■■■■■■■ ■ ■■■■■■■■ ■■■■■■■■■■■■ ■■■■ ■■■■■■■■ ■■■■■■■ ■■■■■■ ■■■■ ■ ■■■■■■■■ ■■■■■■■■■■ ■■■■■ ■■■ ■■■■■■■ ■■■■■■■■■■■■■ ■■■ ■ ■■■■■■■■■■■ ■■ ■ ■■■■■■■■■■ ■■■■■ ■■ ■■■■ ■■■ ■■ ■■■■■■■■■■ ■■■■■■

Corporate diversification requires a separate assessment. Acerinox completed its acquisition of Haynes on November xx.xx 2024, connecting Haynes and VDM Metals under common ownership. ■■■■■■ ■■■ ■■■■■■■ ■■■■■ ■■■■■■■■■ ■■■ ■■■■■■■■■■■ ■■■ ■■■■■■ ■■■ ■■■■■ ■■■■ ■■ ■■■■■■■■■■ ■■■■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■ ■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■ ■■■■ ■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■■■■■■■■ ■ ■■■■■■■■■■ ■■■■■■■■ ■■■■ ■■■■■ ■■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■ ■■■ ■■■ ■■■■■■ ■■■■■■■■ ■■■■■■■■■■■■■

Sources & Evidence

1. VDM Metals - Acerinox Completes the Acquisition of Haynes International
   - The November xx.xx 2024 announcement records Acerinox's completed Haynes acquisition through North American Stainless and connects Haynes and VDM within the group's high-performance-alloys business. ([vdm-metals.com](https://www.vdm-metals.com/en/company/news-and-events/news-archive/single/acerinox-completes-the-acquisition-of-haynes-international))
   - Company verification: Acerinox announced completion of its Haynes International acquisition through North American Stainless on November xx.xx 2024.
2. Haynes International - Sales and Service
   - Haynes describes North American service centers, wholly owned European affiliates, on-demand delivery, and end-use support. Its European description separately mentions a distributor for selected corrosion-alloy markets. ([haynesintl.com](https://haynesintl.com/en/sales-and-service/))
3. Haynes International - HAYNES 282
   - Haynes markets HAYNES xx.xx for high-temperature structural applications, specifically including aero and industrial gas-turbine engines. ([haynesintl.com](https://haynesintl.com/en/alloys/alloy-portfolio/high-temperature-alloys/haynes-xx.xx/))
4. ATI 2025 Annual Report
   - Company verification: ATI identifies Haynes as a competitor in nickel-based alloys and superalloys.
5. Haynes International Aerospace Alloys
   - Company verification: Haynes' aerospace brochure offers HAYNES xx.xx and HAYNES xx.xx among its aerospace alloy portfolio.
   - Company verification: The brochure describes worldwide sales offices and service centers.

20.4. Doncasters

Doncasters participates in material supply as well as downstream cast components. ■■■ ■■■■ ■■■■■ ■■■■■■■■■ ■■■■■■■■■ ■■ ■■■■■■■■■ ■■■■■ ■■■■■■■■ ■■■■■ ■■■■■■■■■■ ■■■■■■■ ■■■ ■■■■■■■■■■■■ ■■■■■■ ■■■■■■■■■■■ ■■■ ■■■■■■■■■ ■■■ ■■■■■ ■■■■■■■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■ ■■■■ ■■■■■ ■■■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■ ■■■■■■ ■■■■ ■■ ■■■■■■■■■■ ■■■■■■■ ■■■■■■■■■■ ■■■ ■■ ■■■■■■■■ ■■■■■■■■■ ■■■ ■■■■■■■■■■■■■■■■■■■■■■■■ ■■■■■■■■■■ An unaffiliated buyer therefore has a documented commercial route to investigate, but internal material coverage should not be treated as externally allocated supply.

The relevant agreement must identify the material-selling entity, covered offering, and delivery obligation separately from any cast-component award. ■■■■■■■■■■■ ■■■■■■ ■■■ ■■■■ ■■■■■■■

[illegible] Buyers should keep any reliance on that project conditional on a documented commercial start and an attributable supply commitment, while evaluating the established material businesses on their own merits.

Sources & Evidence

1. DPC Holdings Limited - Draft Registration Statement, April 14, 2026
   - DPC Holdings' April xx.xx 2026 draft registration statement defines Doncasters as the consolidated business and describes internal superalloy supply alongside sales to external aerospace and industrial-gas-turbine customers. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/filename1.htm))
2. Doncasters Superalloys of Long Beach, CA, USA
   - Doncasters identifies its Long Beach operation as Certified Alloy Products Inc. and advertises nickel- and cobalt-based master superalloys for aerospace and other applications. ([doncasters.com](https://www.doncasters.com/contact/location/doncasters-superalloys-of-long-beach-ca-usa))
   - Company verification: Doncasters identifies its Long Beach operation as Certified Alloy Products Inc.
   - Company verification: The operation commercially supplies nickel- and cobalt-based master superalloys for aerospace and other customers.
3. Doncasters Group - DPC Holdings Reports Strong Second Quarter 2026 Results
   - The August xx.xx 2026 results describe an aero-OEM partnership supporting investment in a new Alabama superalloy facility. The statement presents development plans rather than establishing commercial operation of that site. ([ir.doncasters.com](https://ir.doncasters.com/news-and-events/news/news-details/2026/DPC-Holdings-Reports-Strong-Second-Quarter-2026-Results/default.aspx))
   - Company verification: The second-quarter 2026 results identify the continuing Doncasters business with DPC Holdings and document ongoing aerospace operations.
   - Company verification: An aerospace customer partnership supports a planned Alabama superalloy facility; the announcement does not establish that facility as operating capacity.

20.5. Aubert & Duval

Aubert & Duval presents two distinct material-purchasing propositions: its AD730 nickel-alloy listing includes aero-engine disk applications, while its powder catalog separately lists Stellar ABD-1000AM. Alloyed's corporate history records an ABD licensing agreement with Aubert & Duval in 2019. [illegible]

For an unaffiliated powder buyer, the decisive commercial record is an offer identifying the authorized seller, material supplied, and any restrictions relevant to the intended transaction. A catalog entry does not itself establish unrestricted third-party access, and the historical license does not establish customer production acceptance. [illegible]

Sources & Evidence

1. Alloyed - About
   · Alloyed's corporate history records a 2019 licensing agreement with Aubert & Duval over ABD. The history does not publish the complete grant or establish unrestricted third-party purchasing rights. ([alloyed.com](https://alloyed.com/about))
2. AD730 - Nickel alloys - Aubert et Duval
   · Aubert & Duval's AD730 nickel-alloy product listing identifies aero-engine applications including engine disks. It establishes an advertised offering, not a particular customer's purchasing approval. ([aubertduval.com](https://www.aubertduval.com/en/products/ad730-nickel-alloys/))
3. Stellar ABD-1000AM - Powder for additive manufacturing - Aubert et Duval
   · Aubert & Duval maintains a named catalog entry for Stellar ABD-1000AM powder for additive manufacturing, labeled for aerospace among other markets. ([aubertduval.com](https://www.aubertduval.com/en/products/stellar-abd-1000am-xx.xx/))
4. Civil aviation - Aubert et Duval
   · Company verification: Aubert & Duval's civil-aviation portfolio lists AD730 as a nickel alloy for aero-engine and turbine-disc applications.
5. Aubert et Duval : gouvernance
   · Company verification: Aubert & Duval's governance page states that Safran and Airbus have owned the company equally since July 2026.
   · Company verification: The page identifies a French state special share.
6. Metal Powders by Aubert & Duval
   · Company verification: Aubert & Duval advertises nickel-superalloy powders for aeronautics and space alongside its other served industries.

20.6. Western Superconducting Technologies Co., Ltd.

Western Superconducting Technologies has a specific aero-engine material connection rather than only a diversified-materials association. Its catalog identifies GH3536 as a nickel-based high-temperature alloy for aircraft-engine combustion-chamber and additive-material applications. ■■■ ■■■■■■■■ ■■■■■ ■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■ ■■■ ■■■■■■■■■■■ ■■■■■■■ ■■■ ■■■■■■■■■ ■■■■■■■■■■ ■■■■ ■■■■ ■■ ■■■■■■■■■■■ ■■■ ■■■ ■■■■■■■■■ ■■■ ■■■■■■■■ ■■■ ■■■■■■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■ ■■■ ■■ ■■■■■■■■■■■ ■■■■ ■■■ ■■■■■■■■■■ ■■ ■■■■■ ■■■■■■■■■■■■■■■ ■■■■■■■■■■■■

The advertised offering supports supplier screening, not assumed overseas purchasing eligibility or acceptance of another required grade. An international buyer should establish the exact material, selling entity, destination-specific eligibility, and customer acceptance before treating the company as an executable alternative. ■■■■■ ■■■■■ ■■■■■■■■■■■■ ■■■■■■■■ ■ ■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■■■■■■ ■■■■■■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■ ■■ ■■■■■■■■ ■■■■■■■■■■■ ■■ ■■■■■■■■ ■■■■■■■■■■■■ ■■■■ ■■■ ■■ ■■■■■■■ ■■■■■■■■ ■■■■■ ■■■■■ ■■■■■■■■ ■ ■■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■■■■ ■■■ ■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■ ■■ ■■ ■■■■■■■■■■ ■■ ■■■■■■■■■■■■ ■■■■■■■■

Sources & Evidence

1. DFARS 252.225-7009 - Restriction on Acquisition of Certain Articles Containing Specialty Metals
   · Where applicable, DFARS xx.xx-xx.xx restricts specialty-metal origins to the United States, its outlying areas, or qualifying countries, subject to exceptions, and limits the commercial-off-the-shelf exception for unincorporated mill products. ([acquisition.gov](https://www.acquisition.gov/dfars/xx.xx-xx.xx-restriction-acquisition-certain-articles-containing-specialty-metals.))
2. 高性能高温合金 - 西部超导材料科技股份有限公司
   · Western Superconducting Technologies catalogs GH3536 as a nickel-based high-temperature alloy for aircraft-engine combustion-chamber and additive-material applications. No operating or production instructions are used in the profile. ([c-wst.com](https://www.c-wst.com/default/product_view/2023011015GmxRs.html))
   · Company verification: Western Superconducting Technologies publicly catalogs GH3536 as a nickel-based high-temperature alloy for aircraft-engine combustor and additive-material applications.
3. 688122 | SHANGHAI STOCK EXCHANGE
   · The Shanghai Stock Exchange identifies Western Superconducting Technologies Co., Ltd. in Xi'an, lists superalloy bars among its products, and connects superalloys with aeroengines and gas turbines. ([sse.com.cn](https://www.sse.com.cn/star/en/marketdata/snapshot/c/xx.xx.shtml))
   · Company verification: The Shanghai Stock Exchange identifies Western Superconducting Technologies Co., Ltd. and describes its commercial superalloy-bar business serving aero engines and gas turbines.

20.7. Ulbrich Stainless Steels & Special Metals, Inc.

Ulbrich's distinctive role is supplying the required material format rather than merely originating another alloy family. It advertises nickel-based alloys in continuous precision strip and foil for aerospace engine applications. ■■■ ■■■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■■■ ■■■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■■■■ ■■■■■ ■■■■■■■■ ■■■■■■■■ ■■■ ■■■■■■■■■■■■ ■■■■■■■■■■■■■ ■■ ■■■■■■■■■ ■■■■ ■■■■■ ■■■■■■■■ ■■■■■■■■■ ■■■■■ ■■■■■■■■■■■■ ■■■■■■ ■■ ■■■■■■■■■■■■ ■■■■■■■■■■■■■■■ ■■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■■■■■■■ ■■■■■■■ ■■■■■ ■■■■ ■ ■■■■■■ ■■■■■ ■■■■■■■■■

That additional commercial relationship does not remove the need to identify the original material source. Where Boeing D607 applies, raw-material pedigree and intermediate ownership must remain visible through the supply chain. ■■■■■■ ■■■■■■ ■■■■■■ ■■■ ■■■■■■■■■ ■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■ ■■■■■■■■ ■■ ■■■ ■■■■■■■■ ■■■■■■■■■■■■■ ■■■■■■■■ ■■■ ■■■■■■■■■■■■ ■■■■■■■■ ■■■ ■■■■■■■■■■■■■■■ ■■■■■■■■■■■■■ ■■■ ■■■ ■■■■■■ ■■■■■■■■ ■■■■■■■■■■■■ ■■ ■■■■■ ■■■ ■■■■■■■■■■■■ ■■■■■■■■ ■■■ ■■■ ■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■ ■■■■■■■ ■■■■■■■ ■■■■ ■■■■■■■■■■■■ ■■■■■■■■ ■■ ■■■■■■■■■■■■ ■■■■■ ■■ ■■■■■■■■■■■■ ■■■■■■■ ■■■ ■■■■■■■■■ ■■■■■■■■■ ■■■ ■■■■■■■■■ ■■■■■■■■■■■■■■■■

Sources & Evidence

1. Boeing BDS Terms and Conditions Guide - D607 Material Substitution Prohibition
   · Boeing D607 requires raw-material pedigree and traceability, prohibits disguising intermediate ownership, and requires its substance to flow through covered subcontracts. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))

2. Ulbrich - Aerospace Engine Components and High-Temperature Alloys
   · Ulbrich advertises nickel-based alloys in continuous precision strip and foil for aerospace products and describes aerospace engine applications. This supports its specialist material-format role. ([ulbrich.com](https://www.ulbrich.com/applications/aerospace-engine-components-high-temp-alloys/))
3. Supply Chain Management That Understands Your Customer | Ulbrich
   · Ulbrich describes domestic and global upstream sourcing relationships, North American service centers, and distribution of high-performance nickel alloys in Germany, supporting a sourcing-and-regional-service proposition. ([ulbrich.com](https://www.ulbrich.com/company/supply-chain/))
4. Ulbrich Stainless Steels & Special Metals, Inc. - Corporate Brochure
   · Company verification: The brochure identifies Ulbrich Stainless Steels & Special Metals, Inc. and describes family ownership at the brochure's publication date.
   · Company verification: The portfolio includes nickel-base HAYNES xx.xx for aircraft engine parts and Waspaloy for jet-engine applications.
5. Manufacturing Aerospace Metals and Alloys | Ulbrich
   · Company verification: Ulbrich's current aerospace business page advertises nickel-alloy heat-resistant materials.
   · Company verification: Its commercial roles include precision strip and foil rerolling, wire products, and distribution.

20.8. 6K Additive

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A separate August xx.xx 2023 announcement described Ni625 powder as undergoing qualification for Agile Space Industries' A2200 engine. ■■■■ ■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■■■■■■■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■■ ■■■ ■■■ ■■■■■■■■■■ ■■ ■■■■■■■■ ■■■■■■■■■■■■■ ■■■ ■■■■■■■ ■■■■ A buyer relying on that application needs a later customer acceptance record before describing the powder as qualified for it.

■■■ ■■■■■■ ■■■■■■■■■■■■ ■■ ■■ ■■■■■■■■■ ■ ■■■■■■■■■■ ■■■■■■■■■ ■■■ ■ ■■■■■■ ■■■■■■ ■■■■■■■■■■■ ■■■■■■■ ■■ ■■■ ■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■■ ■■■ ■■ ■■■■■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■■■■■■ The Cumberland agreement demonstrates a contracting pathway; it does not transfer another customer's acceptance or establish the present terms of an unrelated purchase.

Sources & Evidence

1. Metal Powder for Additive Manufacturing - 6K Additive
   · 6K Additive's commercial portfolio lists Nickel Ni718 and Nickel Ni625 powders and identifies aerospace among its served industries. ([6kadditive.com](https://6kadditive.com/metal-powder-for-additive-manufacturing/))
   · Company verification: 6K Additive's current commercial powder catalog explicitly offers Nickel Ni718 and Nickel Ni625 powders and identifies aerospace among its served industries. This improves the inherited marketed-portfolio gap without establishing completion of any customer qualification. ([6kadditive.com](https://6kadditive.com/metal-powder-for-additive-manufacturing/))

2. 6K Additive and Cumberland Additive Announce Partnership and Sign Long Term Supply Agreement for Nickel 718
   - The May xx.xx 2023 announcement records a long-term Ni718 supply agreement between 6K Additive and Cumberland Additive. Cumberland serves multiple end markets, so the agreement is not an aerospace-only acceptance record. ([6kinc.com](https://www.6kinc.com/news/press-release/6k-additive-and-cumberland-additive-announce-partnership-and-sign-long-term-supply-agreement-for-nickel-xx.xx/))
   - Company verification: The May xx.xx 2023 company announcement records a long-term agreement to supply Ni718 powder to Cumberland Additive. It supports a dated external-customer relationship, not aerospace-only shipments or current agreement volumes.
3. 6K Additive Partners with Agile Space Industries to Advance Mission to the Moon
   - The August xx.xx 2023 announcement says 6K Additive's Ni625 powder was being qualified for Agile's A2200 engine and describes certification being pursued, rather than completed acceptance. ([6kadditive.com](https://6kadditive.com/news/6k-additive-partners-with-agile-space-industries-to-advance-mission-to-the-moon/))
   - Company verification: 6K Additive's partnership announcement identifies Nickel xx.xx powder being qualified for Agile Space Industries' A2200 engine.
   - Company verification: The wording establishes aerospace qualification activity, not completion of qualification or current flight use.
4. 6K Additive Secures A$48 Million Through Initial Public Offering on the Australian Stock Exchange
   - Company verification: 6K Additive's December xx.xx 2025 announcement identifies 6K Additive, Inc. and reports completion of its ASX initial public offering under ticker 6KA. Planned expansion in that announcement is not counted as completed capacity.

20.9. Linde Advanced Material Technologies, Inc.

Linde Advanced Material Technologies, Inc. presents two distinct commercial propositions: an advertised nickel-powder portfolio and rights to commercialize a licensed aerospace material. [redacted] This establishes a material-supplier role rather than participation inferred from Linde's broader industrial-gas business.

NASA's May xx.xx 2024 announcement identifies the exact company as a co-exclusive GRX-xx.xx licensee. [redacted] Co-exclusive licensing also should not be interpreted as exclusive control of the material's commercial route.

Powder buyers should assess the listed TRUFORM grades and the licensed GRX-xx.xx proposition separately. [redacted] The licensed route adds a commercial option, but an already accepted material remains preferable when the buyer cannot accommodate unresolved acceptance or contractual conditions.

Sources & Evidence

1. Linde AMT - Additive Manufacturing Powders
   - Linde AMT advertises aerospace-grade TRUFORM powders and lists TRUFORM xx.xx xx.xx and xx.xx within its nickel-powder portfolio. ([linde-amt.com](https://www.linde-amt.com/atomization/additive-manufacturing))
   - Company verification: Linde AMT publicly offers aerospace-grade TRUFORM metal powders.
   - Company verification: Its nickel powder portfolio names TRUFORM xx.xx xx.xx and xx.xx.
2. NASA Licenses 3D-Printable Superalloy to Benefit US Economy
   - NASA's May xx.xx 2024 announcement identifies Linde Advanced Material Technologies, Inc. as a co-exclusive GRX-xx.xx licensee and describes rights to produce and market the material. ([nasa.gov](https://www.nasa.gov/centers-and-facilities/glenn/nasa-licenses-3d-printable-superalloy-to-benefit-us-economy/))
   - Company verification: NASA identifies Linde Advanced Material Technologies, Inc. of Indianapolis as a co-exclusive GRX-xx.xx licensee.
   - Company verification: The announcement establishes an aerospace material licensing role in the United States.
3. Linde Advanced Material Technologies Inc. and NASA Announce Licensing Agreement
   - Linde's April xx.xx 2024 announcement states that its NASA agreement grants GRX-xx.xx marketing and selling rights and that Linde could offer the material to the additive-manufacturing market. ([linde-amt.com](https://www.linde-amt.com/news/article-folder/nasa-licensing-agreement))
4. NASA Glenn Earns Commercial Invention of the Year Award
   - NASA's August xx.xx 2025 article reports that its GRX-xx.xx co-exclusive licensees were selling material. This establishes agency-reported commercialization beyond the initial licensing announcement, without establishing a particular buyer's delivery commitment or customer-specific acceptance. ([nasa.gov](https://www.nasa.gov/centers-and-facilities/glenn/nasa-glenn-earns-commercial-invention-of-the-year-award/))

20.10. AMETEK Specialty Metal Products

[redacted] Its joint aerospace brochure locates Fine Tubes in Plymouth, United Kingdom, and Superior Tube in Collegeville, Pennsylvania. These are operating-brand routes within the same business unit, not independent parent-level sourcing alternatives.

[redacted] Those statements support a focused tube-supplier inquiry, but they do not establish approval for every listed material or transfer an approval automatically to Superior Tube. The joint brochure expressly leaves application suitability with the customer.

[redacted] Business-unit breadth can simplify discovery across related tube specialists, while brand-specific contracting preserves accountability. Keeping an already accepted mill is the lower-change alternative when a different brand or site cannot demonstrate the required purchasing eligibility; obtaining quotations from both brands alone does not establish independent corporate diversification.

Sources & Evidence

1. AMETEK Specialty Metal Products - Our Brands
   · AMETEK Specialty Metal Products identifies Fine Tubes and Superior Tube as brands in its portfolio and describes both as precision-tube manufacturers serving aerospace. ([ametekmetals.com](https://www.ametekmetals.com/ourbrands))
   · Company verification: AMETEK Specialty Metal Products identifies Fine Tubes and Superior Tube within its brand portfolio.
2. Fine Tubes - Aerospace
   · Fine Tubes lists aerospace nickel-tube offerings including Alloy xx.xx Alloy X750, Alloy xx.xx Alloy xx.xx and Alloy xx.xx and reports approvals from named aerospace manufacturers. These are the supplier's own approval statements. ([finetubes.co.uk](https://www.finetubes.co.uk/markets/aerospace-tubes))
3. Fine Tubes and Superior Tube - Aerospace Tubing, V3.01.25
   · The joint aerospace-tubing brochure identifies AMETEK SMP as a business unit, locates Fine Tubes in Plymouth, United Kingdom, and Superior Tube in Collegeville, Pennsylvania, and leaves application suitability with the customer. ([finetubes.co.uk](https://www.finetubes.co.uk/-/media/ametekfinetubes/files/downloads/industry-data-sheets/aerospace-brochure.pdf))
4. Precision Aerospace Metal Products - AMETEK Specialty Metal Products
   · Company verification: AMETEK Specialty Metal Products' aerospace brochure advertises nickel-alloy tubing for engine applications.
   · Company verification: Named offerings include xx.xx Waspaloy, C263, X-xx.xx and Nimonic Alloy xx.xx through the Fine Tubes and Superior Tube businesses.

20.11. Rolled Alloys

Rolled Alloys' distinct contribution is intermediary fulfillment for established aerospace materials. Its aerospace portfolio includes xx.xx xx.xx Alloy X, and xx.xx. ▪ ▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪ ▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪ ▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪ ▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪ ▪▪ ▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪

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Where Boeing D607 governs, material pedigree and intermediate ownership must also remain visible. Order-dedicated supply remains an alternative when a stocking arrangement cannot cover the accepted material and documentation.

Rolled Alloys identifies divisions in Canada, Singapore, and China and describes NeoNickel as its exclusive European representative. ▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ The benefit is flexible local fulfillment; the counterweight is dependence on the intermediary's agreed allocation and the underlying material source.

Sources & Evidence

1. Rolled Alloys - Aerospace
   · Rolled Alloys' aerospace portfolio lists nickel offerings including xx.xx xx.xx Alloy X, and xx.xx and advertises stocking and long-term supply arrangements. ([rolledalloys.com](https://www.rolledalloys.com/markets/aerospace/))
   · Company verification: Rolled Alloys advertises aerospace-grade nickel-alloy inventory.
   · Company verification: Its aerospace portfolio names xx.xx xx.xx Alloy X, and xx.xx among the relevant commercial offerings.
2. Rolled Alloys - E-Services Stocking Programs
   · Rolled Alloys describes customer-site replenishment, supplier-held packed orders awaiting shipment instructions, and scheduled arrangements requiring contract or long-term-agreement terms. Allocation and unused-stock responsibilities are buyer verification questions, not disclosed universal program terms. ([rolledalloys.com](https://www.rolledalloys.com/eservices/))
3. Boeing BDS Terms and Conditions Guide - D607 Material Substitution Prohibition
   · Boeing D607 requires traceable material pedigree and prohibits disguising intermediate ownership, supporting the documentation condition attached to Rolled Alloys stocking arrangements when the clause governs the purchase. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
4. Rolled Alloys - New & Expanded Product Inventory
   · Rolled Alloys' March xx.xx 2026 announcement advertises xx.xx and xx.xx nickel plate, X-xx.xx nickel sheet, and xx.xx nickel round bar in its inventory offering. ([rolledalloys.com](https://www.rolledalloys.com/articles/new-and-expanded-product-inventory/))
   · Company verification: Rolled Alloys' March xx.xx 2026 inventory announcement advertises nickel xx.xx xx.xx and X-xx.xx material forms and connects inventory expansion to aerospace, defense, and industrial applications.
5. About Rolled Alloys
   · Rolled Alloys identifies divisions in Canada, Singapore, and China and describes NeoNickel as its exclusive European representative; the statement establishes representation rather than equity ownership. ([rolledalloys.com](https://www.rolledalloys.com/about-us/))
   · Company verification: Rolled Alloys describes its international divisions and identifies NeoNickel as its exclusive European representative.
6. Major Canadian importers in 2024 - 750512 - Bars, rods and profiles, of nickel alloys
   · Company verification: Canada's official 2024 importer record lists Rolled Alloys-Canada, Inc. for nickel-alloy bars, rods, and profiles.
   · Company verification: The record supports a Canadian nickel-alloy trade role, not aerospace end use or current local manufacturing.
7. Aerospace - Rolled Alloys Singapore
   · Company verification: Rolled Alloys' Singapore aerospace catalog offers nickel alloys including xx.xx xx.xx Alloy X and xx.xx for aviation and space-related applications. ([rolledalloys.com.sg](https://www.rolledalloys.com.sg/markets/aerospace/))

20.12. Villares Metals S.A.

Villares Metals S.A. offers a branded Alloy xx.xx sourcing route from a Brazilian specialty-alloy business headquartered in Sumaré, São Paulo. ■■■ ■■■■■■■ ■■■■■■■■■■ ■■■■■■ ■■■■■■ ■■■■■■■■■■■■ ■■■■ ■■■■■■■■■■ ■■■■■■ ■■■■■■■■■ The group's Villares portfolio extends from bars to forged products, providing a producer-oriented alternative to an intermediary listing without establishing every grade-form combination.

The company's catalog separately lists VAT718 with an Alloy xx.xx and AMS xx.xx reference, and VAT718QA with an ASTM B637 reference. Both entries identify aerospace gas-turbine applications. ■■■■■ ■■■■■■■■■■ ■■■■■■■■■■■■ ■■ ■■■ ■■■■ ■■ ■■■■■ ■■■ ■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■■ ■■■■■■■■■■■■■ ■■ ■■■ ■■■■■■■■ ■■■■■■■■■■■■ ■■■ ■■ ■■■■■■■ ■■■■■■■■■■■■■■■■■■ ■■■■■■ ■■■■■■■ ■■■■ ■■■■■■■■■ ■■■■■ ■■■■

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Sources & Evidence

1. Boeing BDS Terms and Conditions Guide - D607 Material Substitution Prohibition
   - Boeing D607 prohibits unauthorized material substitutions, recognizes authorized alternatives, and makes permitted deviations contract-specific; this bounds switching to a Villares offering under a covered purchase. ([boeingsuppliers.com](https://www.boeingsuppliers.com/content/dam/boeing/boeingsuppliers/boeing-suppliers/becoming/terms/clause-index/dxxx/D607_20131115.pdf))
2. Villares Metals - High Temperature Resistant
   - Villares separately lists VAT718 with Alloy xx.xx and AMS xx.xx references and VAT718QA with an ASTM B637 reference; both entries identify aerospace gas-turbine applications. ([villaresmetals.com.br](https://www.villaresmetals.com.br/en/solutions-xx.xx/products/specialty-alloys/high-temperature-resistant/))
   - Company verification: The official product catalog offers VAT718 and VAT718QA and explicitly identifies aerospace gas-turbine applications.
   - Company verification: The catalog establishes a commercially advertised superalloy-material offering, not aerospace shipment volumes or market share.
3. Villares Metals - About Us
   - Villares identifies its Brazilian headquarters in Sumaré, São Paulo, and states that it belongs to voestalpine's High Performance Metals division. Its history identifies Villares Metals S.A. ([villaresmetals.com.br](https://www.villaresmetals.com.br/en/company/about-us/))
4. voestalpine High Performance Metals USA - Villares Metals
   - voestalpine's Villares business page describes a special-steel and specialty-alloy portfolio extending from bars to forged products and identifies aerospace among its served industries. ([voestalpine.com](https://www.voestalpine.com/highperformancemetals/usa/en-us/the-company/villares-metals/))
5. Sobre nós - Villares Metals
   - Company verification: Villares identifies its Brazilian headquarters in Sumaré, São Paulo, and its specialty-steel and alloy business.
   - Company verification: The company history identifies Villares Metals S.A. and states that the business belongs to voestalpine's High Performance Metals division.

20.13. EOS GmbH

EOS GmbH participates through an equipment-associated powder offering, not only through equipment sales. ■■■ ■■■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■ ■■■■■■ ■■■■■■ ■■■ ■■■■■■ ■■■

[redacted] EOS states that its nickel powders ship with inspection certificates under EN xx.xx Type xx.xx or Type xx.xx.

[redacted] This supports a commercial material route and a documented licensing relationship, but does not identify EOS as the manufacturer of every powder in its portfolio or establish stock for a particular order.

For an EOS-system user, the purchasing attraction is the association between the material offer and platform documentation. Before commitment, the buyer should confirm the contracting seller, required certificate, customer acceptance, and delivery obligation. [redacted]

Sources & Evidence

1. EOS - Nickel Alloys for Industrial 3D Printing
   - EOS lists IN625, IN718, IN939, HX, and HAYNES xx.xx powders for EOS metal systems, identifies aerospace applications, and states that nickel powders ship with EN xx.xx Type xx.xx or Type xx.xx inspection certificates. ([eos.info](https://www.eos.info/metal-solutions/metal-materials/nickel-alloys))
   - Company verification: EOS markets nickel-alloy powders including IN718, IN625, HX, IN939, and HAYNES xx.xx and explicitly identifies aerospace gas turbines among applications.
2. EOS Store - EOS NickelAlloy HAYNES 282
   - The EOS Store lists HAYNES xx.xx powder, provides a sales-contact route, associates it with EOS metal systems, and states that it is manufactured under license from Haynes International. It does not identify the producer of every EOS powder. ([store.eos.info](https://store.eos.info/products/eos-nickelalloy-haynes%C2%AE-xx.xx%C2%AE))

20.14. SeAH Changwon Integrated Special Steel Corporation

[redacted] Its aerospace portfolio states that it manufactures and supplies component materials domestically and internationally and lists designations including N07718, N06625, N07738, and N07001. This establishes an advertised offering by the Changwon business rather than a capability inferred from the SeAH name alone.

A posted DNV management-system certificate identifies the exact corporation in the Republic of Korea and covers manufacture of special-steel and superalloy bars, seamless tubes, pipes, wire rods, and forged products. The certificate states an ISO xx.xx:2015 validity period from June xx.xx 2024 through June xx.xx 2027. [redacted]

A component buyer can use these records to initiate a source-specific inquiry, but should require an offer linking the grade, form, supplying site, origin documentation, and customer acceptance before award. [redacted]

■■■ ■■■■■■■■■■ ■■■■■■■■■■■■ Credentials belonging to another group business should not replace evidence for the quoted Changwon supply.

Sources & Evidence

1. SeAH CSS - Aerospace & Defense
   · SeAH CSS states that it manufactures and supplies aerospace-component materials domestically and internationally and lists N07718, N06625, N07738, and N07001 among its aerospace material designations. ([seahcss.co.kr](https://www.seahcss.co.kr/eng/application/aerospace.asp))
   · Company verification: SeAH's aerospace page states that it manufactures and supplies aerospace-component materials and lists grades including N07718, N07738 and N07001. ([seahcss.co.kr](https://www.seahcss.co.kr/eng/application/aerospace.asp))
2. DNV - Management System Certificate for SeAH Changwon Integrated Special Steel Corporation
   · The DNV certificate identifies SeAH Changwon Integrated Special Steel Corporation in the Republic of Korea, states ISO xx.xx:2015 validity from June xx.xx 2024 through June xx.xx 2027, and covers manufacture of special-steel and superalloy bars, seamless tubes, pipes, wire rods, and forged products. ([seahcss.co.kr](https://www.seahcss.co.kr/UploadFile/%5BQMS%5D%20ISO%xx.xx%28UKAS%xx.xx%xx.xx~2027.pdf))
3. Management System Certificate - SeAH Changwon Integrated Special Steel Corporation
   · Company verification: The posted management-system certificate identifies SeAH Changwon Integrated Special Steel Corporation and its Korean manufacturing scope covering special steel and superalloy bars, tubes, wire rods and forged products. ([seahcss.co.kr](https://www.seahcss.co.kr/UploadFile/%5BQMS%5D%20ISO%xx.xx%28UKAS%xx.xx%xx.xx~2027.pdf))

20.15. Alloyed Ltd.

Alloyed Ltd.'s distinctive role is proprietary-alloy commercialization rather than simply another stocking channel. ■■■ ■■■■■■■■■ ■■■■■■■ ■■■■■■■ ■ ■■■■ ■■■ ■■■■■■■■■ ■■■■■■■■■ ■■■■■ ■■■■■■ ■ ■■■■■■ ■■■ ■■■■■■■■ ■■■■■ ■■■■■ ■■■■■■■■■■■■ ■■■■■■■■ ■■■■■ ■■■■■■■■■ ■■■ ■■■■■■■■■■ ■■■ ■■■■■■■■■■ ■■■ ■■ ■■ ■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■ Together, these records connect the proprietary offering to a documented commercial partner.

■■■ ■■■■■■■■■■■■ ■■■■■■■■■ ■■■ ■■■■■■■■■■ ■■ ■■■■■■■■ ■■■■■■■ ■■■■■ ■■■■■ ■■ ■■■■■■■■■■■■ ■■■■■■ ■■■■■ ■■■ ■■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■■ A prospective producer or distributor seeking broader commercialization rights needs the relevant grant, including its offering and geographic scope. A partner's catalog entry does not itself establish unrestricted sublicensing, resale, or territorial rights for an unrelated party.

A licensed-partner route can therefore be relevant when the buyer specifically requires an ABD offering, but the public records do not settle complete license terms or customer-specific access. Prospective partners should establish permissions before promising a proprietary material channel; buyers should establish which party accepts the supply obligation. ■■■■■ ■■ ■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■■ ■■ ■■■ ■■■■■■■■■■■■■■■■ ■■■■■■ ■■■■■ ■■■■ ■■■■■■■■■■■ ■■■■■■■■■■ ■■■■■ ■■■■ ■■■ ■■■■■■■■ ■■■■■ ■■■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■■■■■■■■■■■■■■■ ■■■■■■■■■■■■■■■■■■ ■■■■■■■ ■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■■■■

Sources & Evidence

1. Alloyed - About
   · Alloyed's corporate history records an ABD licensing agreement with Aubert & Duval in 2019. The history supports the relationship but does not disclose its complete contractual grant. ([alloyed.com](https://alloyed.com/about))
2. Aubert & Duval - Metal Powders, June 2024
   · Aubert & Duval's June 2024 commercial powder brochure lists ABD-900AM and ABD-1000AM among nickel superalloys and identifies ABD as an Alloyed registered trademark. The listing does not disclose unrestricted third-party commercialization rights. ([aubertduval.com](https://www.aubertduval.com/wp-content/uploads/2024/xx.xx/2024-xx.xx-Aubert-Duval-Metal-Powders-for-Additive-Manufacturing-Brochure_web.pdf))
3. Additional Investment in Alloyed Ltd. — Promoting collaboration with Oxford University startups in the advanced materials field —
   · Company verification: The November xx.xx 2024 announcement identifies Alloyed Ltd. and JX's additional investment in the U.K. alloy-design business.
4. TCT Magazine: Putting the super in superalloy | Alloyed
   · Company verification: Alloyed promotes its ABD-900AM nickel-superalloy product for aerospace and turbomachinery and describes its commercial launch in 2020.
5. Metal Powders by Aubert & Duval
   · Company verification: The commercial powder brochure lists nickel superalloys ABD-900AM and ABD-1000AM and identifies ABD as an Alloyed trademark.
6. ABD®-900AM New Nickel Powder for Additive Manufacture (Alloyed) | Special Site of JX Advanced Metals
   · Company verification: The partner catalog attributes the advertised ABD-900AM product to Alloyed.

21. Companies Covered

Table 569. Global Nickel-Based Superalloys for Aerospace Market, Companies Covered

Company
3D Systems
6K Additive
Acciaierie Valbruna
ACNIS do Brasil
Advanced Alloy Services Ltd.
Advanced Revert LLC
Aero-Vac Alloys & Forge
Aerolloy Technologies Limited
AL LIWARA General Trading LLC
Alinox
Alleima
Alloy Wire International
Alloyed Ltd.
Alloys International, Inc.
American Special Metals, Corp.
AMETEK Specialty Metal Products
AMMatz Group
AP&C
Aperam S.A.
Armco 2000 Group
ASA Alloys
Ashraf Nickel Alloys
ASM Aerospace Specification Metals
ATI Inc.
Aubert & Duval
Austral Wright Metals
Avalloy
Aviagroup Industries
Avimetal AM Tech Co., Ltd.
AVT Aeroparts

Table 569 - continued

Company
AZOBEX
B&S Aircraft Alloys
Baowu Tezhong Yejin Youxian Gongsi
Barnes Aerospace
Beijing Gangyan Gaona Keji Gufen Youxian Gongsi
BGH Edelstahlwerke
Bhansali AeroAlloys LLP
Cannon-Muskegon
Carpenter Technology Corporation
Castle Metals
Central Wire Industries
Cogne Acciai Speciali S.p.A.
Consolidated Precision Products
Continuum Powders
CONUAR
CotaFix
Daido Steel Co., Ltd.
Daliff Precision Engineering (Pty) Ltd
Deutsche Nickel GmbH
Dipti Metal Industries
DNIPROSPETSSTAL
Doncasters
Dynamic Metals Ltd
E Steel Sdn Bhd
ECKART TLS
Electralloy
Elementum 3D, Inc.
ELLWOOD Quality Steels
EOS GmbH
Falcontech
FFF Australia
fi additive

Table 569 - continued

Company
Fine Tubes
Foroni S.p.A.
FRISA
Fushun Special Steel
GKN Powder Metallurgy
Globo Usinagem
Gloria Material Technology Corp.
GMS Aços
Guangzhou Sailong Additive Manufacturing Co., Ltd.
Hassan Sheets and Plate
Haynes International, Inc.
HH Special Metal
High Performance Alloys, Inc.
Hiperoy
Howmet Aerospace Inc.
Höganäs AB
Icon Steel
IHI Master Metal Co., Ltd.
IKT - ITHRA AL-KHUBRA
INDO-MIM Limited
Jiangsu Longda Superalloy Co., Ltd.
Jiangsu ToLand Alloy Co., Ltd.
JX Advanced Metals Corporation
Kennametal Stellite
Kuzp
Lattice Aerospace
Linde Advanced Material Technologies, Inc.
m4p material solutions GmbH
Madiba Metals
Mega Mex
Metal Heart
Metalcycle Global

Table 569 - continued

Company
Metallurgicheskiy Zavod Elektrostal
Metalpine GmbH
Metalwerks, Inc.
Metalyns
MIMETE S.r.l.
Mishra Dhatu Nigam Limited
Morimura Bros., Inc.
MSE Supplies LLC
Multi Alloys
Multialloy Metais e Ligas Especiais
Nabil Nickel Alloys
Nasir Nickel Alloys
Neith Metals
NeoNickel
Nexteam
Niagara Specialty Metals
Nickel Alloy Metals & Machinery W.L.L.
Nickel Alloys
Nickel Marketing Consultancy W.L.L.
Nifty Alloys LLC
Nippon Yakin
Non-Polymeric3D
NORM 3D
Novametal Middle East
Oerlikon Metco
Olwan Nickel Alloys
Olympic Precision Machining
Osprey Atomiqs Limited
Paya Mavad Technical Co.
PBS Velká Bíteš
Platinum Metals IND LLC
Plymouth Tube Company

Table 569 - continued

Company
Powder Alloy Corporation
PrecisionWorx
Prime Powders Inc.
Proda Industrial Design
Project Steels & Piping DMCC
Proterial, Ltd.
Pursuit Aerospace
PX Précimet
RAM3D
REALUM
Renishaw plc
Revert Alloys & Metals Ltd.
Revolution Materials
Roberto Cordes S.A.
Rolex Alloys International
Rolled Alloys
Rosswag GmbH
Ruspolymet
S-Tech Corp.
Samuel, Son & Co., Limited
Sanyo Special Steel Co., Ltd.
Scope Metals Group
Scot Forge
SeAH Changwon Integrated Special Steel Corporation
SeAH Superalloy Technologies
Sentes-BIR A.Ş.
Smiths Metal Centres
Special Metals Corporation
Specialty Metals
Steelinox
Stupinskaya Metallurgicheskaya Kompaniya
Super Pioneer Technology LTD.

Table 569 - continued

Company
Swiss Steel Group
TEI Alloys Inc.
Tekna Holding ASA
thyssenkrupp Aerospace
Titan Engineering Pte Ltd
Titanium Industries
tk accelis Supply Chain Solutions
Transcrystal Alloy Industrial Corp.
TW Metals
UJP PRAHA a.s.
Ulbrich Stainless Steels & Special Metals, Inc.
UMP-M
United Performance Metals
Varzene Metal
VDM Metals
Villares Metals S.A.
voestalpine BÖHLER Edelstahl GmbH & Co KG
WAYMA Powders
Wedge Industrial Co., Ltd.
Western Superconducting Technologies Co., Ltd.
Xi'an Bright Laser Technologies Co., Ltd.
Xi'an Sino-Euro Materials Technologies Co., Ltd.
Zapp Precision Metals GmbH
Zhonghe Shangda Aeronautic Materials Co., Ltd.
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Sources & Evidence

1. ATI 2025 Annual Report
   - Company verification: ATI's 2025 annual report establishes continuing nickel-superalloy and metallic-powder production for jet engines and identifies aircraft-engine manufacturer supply agreements.
   - Company verification: ATI identifies Carpenter as a competitor in nickel-based alloys and superalloys.
   - Company verification: ATI identifies Haynes as a competitor in nickel-based alloys and superalloys.
   - Company verification: ATI identifies VDM Metals as a nickel-alloy and superalloy competitor and an Acerinox subsidiary.

2. Carpenter Technology Corporation - First Quarter Fiscal Year 2026 Earnings Call
   - Company verification: Carpenter's October xx.xx 2025 earnings presentation documents continuing aerospace business, negotiated long-term agreements, and its commercial nickel-superalloy business.
3. Precision Castparts Corp. | About
   - Company verification: PCC's corporate history identifies Cannon-Muskegon as its acquired nickel-alloy casting-feedstock business.
   - Company verification: PCC identifies Special Metals as its acquired nickel-material business supplying its forging operations.
   - Company verification: Special Metals and Cannon-Muskegon share PCC ownership but have distinguishable operating roles.
4. Doncasters Group - DPC Holdings Reports Strong Second Quarter 2026 Results
   - Company verification: The second-quarter 2026 results identify the continuing Doncasters business with DPC Holdings and document ongoing aerospace operations.
   - Company verification: An aerospace customer partnership supports a planned Alabama superalloy facility; the announcement does not establish that facility as operating capacity.
5. OSPREY ATOMIQS LIMITED - Companies House Overview
   - Company verification: Companies House identifies Osprey Atomiqs Limited, company number xx.xx as active.
   - Company verification: The registry records Sandvik Osprey Limited as its previous name through October xx.xx 2026.
6. Osprey Becomes an Independent Company with Strategic Agenda
   - Company verification: Osprey's October 2026 business announcement confirms its transition to an independent company.
   - Company verification: The independence event and the subsequent registered-name change are separate dated identity facts.
7. Oerlikon Annual Report 2025
   - Company verification: Oerlikon's 2025 annual report identifies continuing Metco operating entities in its consolidated group, including material businesses in several countries.
   - Company verification: The filing supports the Metco business reporting level, not attribution of the entire Oerlikon portfolio to aerospace nickel-superalloy powders.
8. Höganäs forAM 718 VG - Commercial Product Data Sheet
   - Company verification: Höganäs offers forAM xx.xx VG as a named nickel-superalloy powder and explicitly identifies aerospace and gas-turbine applications.
9. Pushing Possibilities in the Space and Aerospace Industries - Alleima
   - Company verification: Alleima's July xx.xx 2025 aerospace and space business article advertises nickel-alloy material supply, including Sanicro xx.xx bar.
   - Company verification: This dated commercial record supplements its captured aerospace tubing catalog.
10. Tekna Holding ASA - Annual Report 2024
    - Company verification: Tekna's 2024 annual report explicitly records discontinuation of lower-margin nickel-alloy powder production in favor of titanium and aluminum products.
    - Company verification: This establishes a portfolio-withdrawal fact, not closure of Tekna's wider business.
11. Tekna Holding ASA - Annual Report 2025
    - Company verification: Tekna's 2025 annual report confirms continuing operations but describes its nickel nanomaterial activity as serving microelectronics applications.
    - Company verification: The reported nickel nanomaterial activity does not establish aerospace nickel-superalloy powder participation.
12. Our Brands | AMETEK Specialty Metal Products
    - Company verification: AMETEK Specialty Metal Products identifies Fine Tubes and Superior Tube within its brand portfolio.
    - Company verification: Fine Tubes is nested within the separately staged AMETEK Specialty Metal Products business and must not be counted as an additional independent supplier.

13. O'Neal Industries and Affiliates | United Performance Metals
    - Company verification: United Performance Metals identifies itself and TW Metals as distinct affiliates in the O'Neal Industries family.
    - Company verification: TW Metals and United Performance Metals share O'Neal Industries affiliation; their separate operating-business identities do not establish independent ultimate ownership.
14. New & Expanded Product Inventory - Rolled Alloys
    - Company verification: Rolled Alloys' March xx.xx 2026 inventory announcement advertises nickel xx.xx xx.xx and X-xx.xx material forms and connects inventory expansion to aerospace, defense, and industrial applications.
15. About Rolled Alloys
    - Company verification: Rolled Alloys describes its international divisions and identifies NeoNickel as its exclusive European representative.
    - Company verification: The principal's own business page corroborates NeoNickel's European representation role.
    - Company verification: The representation statement alone does not establish equity ownership or a fully resolved consolidation boundary.
16. 北京钢研高纳科技股份有限公司 2026 年半年度报告全文
    - Company verification: The 2026 interim filing explicitly gives Gaona Aero Material Co.,Ltd. as the foreign-language company name for 北京钢研高纳科技股份有限公司.
    - Company verification: This resolves the English-name question but does not establish the missing exact nickel-base aerospace offering.
    - Company verification: The 2026 interim filing identifies 北京钢研高纳科技股份有限公司.
    - Company verification: It describes commercial superalloy materials and products serving aerospace; the exact nickel-base product subset remains unresolved.
17. 万泽实业股份有限公司 2026 年半年度报告全文
    - Company verification: The company-information section of the 2026 interim filing explicitly identifies Wedge Industrial Co., Ltd. as the issuer's foreign-language name.
    - Company verification: Wedge's 2026 interim filing identifies the Chinese issuer and describes nickel-base master-alloy materials and related aerospace-engine alloy businesses. It does not separately establish aerospace material sales. ([static.cninfo.com.cn](https://static.cninfo.com.cn/finalpage/2026-xx.xx-xx.xx/xx.xx.PDF))
18. Swiss Steel Group Creates Completely New Possibilities Through Additive Manufacturing and Optimized Metal Powders
    - Company verification: Swiss Steel Group's February xx.xx 2024 commercial announcement offers Printdur Ni625 nickel-based powder.
    - Company verification: The announcement discusses aerospace among additive-manufacturing applications generally; it does not establish a grade-specific aerospace customer or current group consolidation.
19. Acerca de GMTC - Historia | Gloria Material Technology Corp.
    - Company verification: Gloria Material's own corporate history records a nickel-superalloy xx.xx program in 2007 and an earlier entry into aerospace.
    - Company verification: These are historical business facts, not confirmation of a current aerospace nickel-superalloy catalog.
20. ATI Aerospace Materials
    - Company verification: ATI's aerospace portfolio lists nickel- and cobalt-based materials and powder superalloys for aero-engine applications.
    - Company verification: ATI states that its aerospace offering includes mill products, forgings, castings, and components.
21. High-Performance Soft Magnetic Alloys for Aerospace Avionics and Electrification | Carpenter Technology
    - Company verification: Carpenter's aerospace-engine portfolio offers nickel-base xx.xx and Waspaloy for engine applications.

22. Business Segments | Carpenter Technology
    - Company verification: Carpenter Technology Corporation identifies Specialty Alloys Operations as a manufacturing business supplying high-temperature superalloys in long-product forms.
    - Company verification: The company describes facilities in the United States, Europe, and Asia.
23. Special Metals | Aerospace
    - Company verification: Special Metals' aerospace catalog lists INCONEL alloy xx.xx NIMONIC alloy xx.xx Waspaloy, and other aerospace alloys.
24. Precision Castparts Corp. | Metals Products
    - Company verification: Precision Castparts identifies Special Metals Corporation within its Metals Group.
25. Cannon Muskegon | About
    - Company verification: Cannon-Muskegon describes nickel-base casting-alloy supply serving aerospace.
    - Company verification: Its named proprietary offering includes CMSX-xx.xx.
26. Cannon Muskegon | Manufacturing
    - Company verification: Cannon-Muskegon's product ranges identify aerospace nickel alloys and list CMSX-xx.xx IN-xx.xx IN-xx.xx and other commercial alloy names.
27. Haynes International Aerospace Alloys
    - Company verification: Haynes' aerospace brochure offers HAYNES xx.xx and HAYNES xx.xx among its aerospace alloy portfolio.
    - Company verification: The brochure describes worldwide sales offices and service centers.
28. VDM Metals | Acerinox completes the acquisition of Haynes International
    - Company verification: Acerinox announced completion of its Haynes International acquisition through North American Stainless on November xx.xx 2024.
    - Company verification: The acquisition announcement identifies Haynes and VDM Metals as businesses forming Acerinox's high-performance alloys division.
29. VDM-Metals | Aerospace
    - Company verification: VDM's aerospace portfolio lists VDM Alloy xx.xx and Alloy xx.xx.
    - Company verification: VDM states that it supplies pre-material for rotating and non-rotating aircraft-engine parts and identifies U.S. and U.K. commercial contacts.
30. Doncasters Superalloys of Long Beach, CA, USA
    - Company verification: Doncasters identifies its Long Beach operation as Certified Alloy Products Inc.
    - Company verification: The operation commercially supplies nickel- and cobalt-based master superalloys for aerospace and other customers.
31. Civil aviation - Aubert et Duval
    - Company verification: Aubert & Duval's civil-aviation portfolio lists AD730 as a nickel alloy for aero-engine and turbine-disc applications.
32. Aubert et Duval : gouvernance
    - Company verification: Aubert & Duval's governance page states that Safran and Airbus have owned the company equally since July 2026.
    - Company verification: The page identifies a French state special share.
33. BÖHLER LHX - NI-BASE ALLOYS
    - Company verification: The BÖHLER LHX catalog identifies voestalpine BÖHLER Edelstahl GmbH & Co KG.
    - Company verification: It offers the nickel-base alloy in bar, billet, plate, and forging-related forms for aerospace engine applications.
34. Products Archive - aperam
    - Company verification: Aperam's superalloy catalog offers IMPHY xx.xx and IMPHY xx.xx series products.
    - Company verification: The catalog establishes named nickel-alloy offerings but does not by itself resolve aerospace-specific sales.
35. Imphy - aperam
    - Company verification: Aperam identifies its Imphy operation as a producer of nickel and cobalt alloys.

36. Universal Stainless Announces Completion of its Acquisition by Aperam
· Company verification: Universal Stainless & Alloy Products, Inc. announced completion of its acquisition by Aperam S.A. on January xx.xx 2025.
37. Forging Billets: Universal Stainless
· Company verification: Universal Stainless' public forging-billet catalog lists xx.xx among its offered grades.
38. MetcoAdd / MetcoMed - Powder Portfolio for Additive Manufacturing
· Company verification: Oerlikon Metco's powder portfolio offers MetcoAdd xx.xx and HX series nickel-based products with aerospace engine or airframe applications.
39. 3D-printed aerospace parts | Höganäs
· Company verification: Höganäs advertises heat- and corrosion-resistant nickel-alloy powders for aviation components.
· Company verification: Its aerospace page identifies the forAM powder portfolio.
40. Metal powders and alloys | Osprey
· Company verification: Osprey's current materials portfolio includes nickel-superalloy powders for consolidation and near-net-shape products.
41. Aerospace, defence and medical materials | Osprey
· Company verification: Osprey's aerospace page advertises powders and alloys for engines, structures, and additive-built aerospace components.
42. About Osprey | Independent materials platform
· Company verification: The current company materials identify Osprey Atomiqs Limited and a production footprint in the United Kingdom and Sweden.
43. Osprey is now an independent company
· Company verification: The legacy supplier transition notice states that Osprey Metal Powder and CE Alloys became independent under new ownership on October xx.xx 2026, with the existing portfolio continuing.
44. MA-X | Proterial, Ltd.
· Company verification: Proterial offers MA-X nickel alloy for aircraft applications including jet-engine exhaust-related components.
45. Daido Steel Group Integrated Report 2025
· Company verification: Daido's 2025 integrated report describes nickel-rich superalloy offerings in bars, wire rods, strip, and forgings with aircraft applications.
· Company verification: The report treats expanded large rotating-part prime certification as an objective, not an already-established qualification.
46. Products-Products-Toland
· Company verification: ToLand's current catalog offers nickel-based superalloy materials and identifies aerospace among the served industries.
· Company verification: The catalog identifies Jiangsu ToLand Alloy Co., Ltd.
47. Company Profile-Toland
· Company verification: Jiangsu ToLand Alloy's company profile identifies production and sales of high-temperature alloy materials for aerospace and other equipment markets.
· Company verification: The profile identifies its Shenzhen listing.
48. 高性能高温合金-西部超导材料科技股份有限公司
· Company verification: Western Superconducting Technologies publicly catalogs GH3536 as a nickel-based high-temperature alloy for aircraft-engine combustor and additive-material applications.
49. 688122 | SHANGHAI STOCK EXCHANGE
· Company verification: The Shanghai Stock Exchange identifies Western Superconducting Technologies Co., Ltd. and describes its commercial superalloy-bar business serving aero engines and gas turbines.

50. 抚顺特钢：全力打造中国第一特殊钢冶炼企业_抚顺市人民政府
    - Company verification: The August xx.xx 2024 municipal publication identifies 抚顺特殊钢股份有限公司 and reports its aerospace superalloy activity.
    - Company verification: The record does not establish a current named nickel-base aerospace grade.
51. MIDHANI Achieves Major Milestone in Indigenous Aero-Engine Material Qualification : CEMILAC Certification
    - Company verification: MIDHANI reports CEMILAC clearance for series production of several superalloy grades and forms for aero-engine applications.
    - Company verification: This company announcement does not identify the complete nickel-base grade subset.
52. Capability Overview - Aerolloy Technologies
    - Company verification: Aerolloy advertises aerospace material and component offerings that include nickel superalloys.
    - Company verification: Its capability overview identifies ingots, billets, and preforms and states that its forging operation entered production in March 2026.
53. The PTC Group - Aerolloy Technologies
    - Company verification: Aerolloy identifies itself as the aerospace materials subsidiary of PTC Industries Ltd.
54. Anticipated acquisition by Acerinox, S.A. of Haynes International, Inc. - Full text decision
    - Company verification: Original customer responses recorded by the CMA identify ATI as an alternative flat-nickel supplier.
    - Company verification: Original customer responses recorded by the CMA identify Special Metals as an alternative flat-nickel supplier.
    - Company verification: Original customer and competitor responses recorded by the CMA identify Nippon Yakin as an alternative flat-nickel supplier; this does not establish aerospace-superalloy participation.
55. NASA Licenses 3D-Printable Superalloy to Benefit US Economy
    - Company verification: NASA's May xx.xx 2024 announcement identifies Elementum 3D, Inc. of Erie, Colorado as a co-exclusive GRX-xx.xx licensee.
    - Company verification: The agreements permit production and marketing to airplane and rocket equipment manufacturers and their supply chains; the announcement does not establish current sales.
    - Company verification: NASA identifies Linde Advanced Material Technologies, Inc. of Indianapolis as a co-exclusive GRX-xx.xx licensee.
    - Company verification: The announcement establishes an aerospace material licensing role in the United States.
    - Company verification: NASA identifies Powder Alloy Corporation of Loveland, Ohio as a co-exclusive GRX-xx.xx licensee.
    - Company verification: The agreement permits production and marketing for aerospace supply chains, without establishing current commercial shipments.
56. Additive Manufacturing Powders | Linde AMT
    - Company verification: Linde AMT publicly offers aerospace-grade TRUFORM metal powders.
    - Company verification: Its nickel powder portfolio names TRUFORM xx.xx xx.xx and xx.xx.
57. Ulbrich Stainless Steels & Special Metals, Inc. - Corporate Brochure
    - Company verification: The brochure identifies Ulbrich Stainless Steels & Special Metals, Inc. and describes family ownership at the brochure's publication date.
    - Company verification: The portfolio includes nickel-base HAYNES xx.xx for aircraft engine parts and Waspaloy for jet-engine applications.
58. Manufacturing Aerospace Metals and Alloys | Ulbrich
    - Company verification: Ulbrich's current aerospace business page advertises nickel-alloy heat-resistant materials.
    - Company verification: Its commercial roles include precision strip and foil rerolling, wire products, and distribution.

59. About - High Performance Alloys
    - Company verification: High Performance Alloys describes itself as family owned and operated.
    - Company verification: It identifies producer, distributor, and service-center roles serving aerospace and other industries.
60. Alloy 718 - UNS N07718
    - Company verification: High Performance Alloys maintains a public product page for Alloy xx.xx UNS N07718.
    - Company verification: This establishes a named nickel-superalloy offering rather than only general aerospace exposure.
61. Electralloy - Product Focus: Nickel Bar
    - Company verification: Electralloy advertises nickel bar for aerospace and defense applications.
    - Company verification: Its nickel product offering also includes forging ingot, forging billet, and remelt product supplied to service centers, forgers, rerollers, and OEMs.
62. EC625 - Nickel-Based High Performance Alloy
    - Company verification: Electralloy publishes an EC625 nickel-based high-performance alloy product sheet.
    - Company verification: The record establishes the named nickel-alloy product; aerospace-specific shipments are not established.
63. Electralloy retirement announcement - December 6, 2022
    - Company verification: The December xx.xx 2022 company announcement identifies Electralloy as a G. O. Carlson, Inc. company.
    - Company verification: It describes U.S.-manufactured specialty-alloy mill products serving aerospace and other markets.
64. Billet and Bar - Metalwerks
    - Company verification: Metalwerks maintains a public billet-and-bar product offering.
    - Company verification: This supports a materials-supply role, but the inspected record does not establish the exact aerospace nickel-superalloy subset.
65. 6K Additive Partners with Agile Space Industries to Advance Mission to the Moon
    - Company verification: 6K Additive's partnership announcement identifies Nickel xx.xx powder being qualified for Agile Space Industries' A2200 engine.
    - Company verification: The wording establishes aerospace qualification activity, not completion of qualification or current flight use.
66. Precision Aerospace Metal Products - AMETEK Specialty Metal Products
    - Company verification: AMETEK Specialty Metal Products' aerospace brochure advertises nickel-alloy tubing for engine applications.
    - Company verification: Named offerings include xx.xx Waspaloy, C263, X-xx.xx and Nimonic Alloy xx.xx through the Fine Tubes and Superior Tube businesses.
67. Prime Powders Home - Prime Powders
    - Company verification: Prime Powders Inc. advertises nickel-based structural superalloy powders and states that its products are manufactured in Canada.
    - Company verification: Its product-and-application landing page identifies aerospace among the served application categories, without a grade-specific aerospace sales record.
68. Aerospace - Rolled Alloys
    - Company verification: Rolled Alloys advertises aerospace-grade nickel-alloy inventory.
    - Company verification: Its aerospace portfolio names xx.xx xx.xx Alloy X, and xx.xx among the relevant commercial offerings.

69. Major Canadian importers in 2024 - 750512 - Bars, rods and profiles, of nickel alloys
    - Company verification: Canada's official 2024 importer record lists Rolled Alloys-Canada, Inc. for nickel-alloy bars, rods, and profiles.
    - Company verification: The record supports a Canadian nickel-alloy trade role, not aerospace end use or current local manufacturing.
    - Company verification: Canada's official 2024 importer record identifies Samuel, Son & Co., Limited/Samuel & Fils & Cie Ltee for nickel-alloy bars, rods, and profiles.
    - Company verification: The record establishes Canadian trade participation in the wider material category, not the aerospace-superalloy subset.
70. United Performance Metals Catalog | United Performance Metals
    - Company verification: United Performance Metals' catalog offers nickel products including xx.xx Rene xx.xx C263, Waspaloy, and X750.
    - Company verification: The catalog describes material forms and aerospace applications, supporting a specialty-material channel role.
71. About United Performance Metals | United Performance Metals
    - Company verification: United Performance Metals identifies its U.S. headquarters and operating locations.
    - Company verification: Its history documents O'Neal Industries affiliation and describes O'Neal's family-owned business network.
72. 718 Nickel Bar - AMS 5589 - AMS 5596 Bar Supplier | TW Metals
    - Company verification: TW Metals publishes a commercial xx.xx nickel-bar supplier page.
    - Company verification: The record establishes a named nickel-superalloy distribution offering.
73. Aerospace Metal Supplier | Aircraft Grade Metals | TW Metals
    - Company verification: TW Metals publicly advertises aerospace metal-supply services.
    - Company verification: This supports its aerospace channel role when read with its separate nickel-product catalog.
74. Our Products | ASA Alloys
    - Company verification: ASA Alloys publishes a Canadian-facing materials catalog with Canadian-dollar surcharge tables.
    - Company verification: Its public product listings include xx.xx and describe aerospace and specialty-metals customers; exact grade-specific aerospace availability remains unresolved.
75. Superalloy Forgings | FRISA
    - Company verification: FRISA explicitly advertises nickel-based superalloy forgings for aerospace and power generation.
    - Company verification: Named commercial grades include Alloy xx.xx xx.xx Plus, Waspaloy, and other nickel-alloy offerings.
76. Research & Development | Scot Forge
    - Company verification: Scot Forge identifies Inconel xx.xx among its aircraft-quality materials.
    - Company verification: The page advertises aerospace forgings, supporting a forging-supplier role rather than proving independent alloy-melt production.
77. Services at Niagara Specialty Metals - Made in the USA
    - Company verification: Niagara Specialty Metals advertises material-processing and conversion services for aerospace and other industries.
    - Company verification: Its stated material scope includes nickel-based alloys, but the page does not establish a named aerospace nickel-superalloy grade.
78. Frequently Asked Questions - Niagara Specialty Metals
    - Company verification: Niagara Specialty Metals describes itself as an employee-owned mill in Western New York.
    - Company verification: Its aerospace examples include material families outside this market, so general aerospace exposure is not treated as proof of nickel-superalloy participation.

79. Precision Machining Services | Aero-Vac Alloys & Forge
    - Company verification: Aero-Vac Alloys & Forge advertises services involving aerospace metals, including nickel superalloys xx.xx and xx.xx.
    - Company verification: It also accepts customer-supplied material, so this page alone does not establish independent stock sales or primary alloy production.
80. Inconel 718 Plates, Sheets, Bars, Tubes, and more - American Special Metals
    - Company verification: American Special Metals publishes an Inconel xx.xx product page advertising plates, sheets, bars, tubes, and other forms.
    - Company verification: The inspected page establishes a named distribution offering, not current aerospace-specific shipments.
81. High temperature resistant - Villares Metals
    - Company verification: The official product catalog offers VAT718 and VAT718QA and explicitly identifies aerospace gas-turbine applications.
    - Company verification: The catalog establishes a commercially advertised superalloy-material offering, not aerospace shipment volumes or market share.
82. Sobre nós - Villares Metals
    - Company verification: Villares identifies its Brazilian headquarters in Sumaré, São Paulo, and its specialty-steel and alloy business.
    - Company verification: The company history identifies Villares Metals S.A. and states that the business belongs to voestalpine's High Performance Metals division.
83. Inconel 718 - REALUM
    - Company verification: REALUM identifies itself as a São Paulo distributor of Inconel xx.xx and other specialty materials serving Brazil.
    - Company verification: Its Inconel xx.xx commercial page lists aerospace applications and advertises bars, plates, and tubes.
    - Company verification: The page does not establish actual aerospace customer deliveries or independent market leadership.
84. Níquel e suas Ligas | Madiba Metals
    - Company verification: Madiba's nickel-alloy catalog lists Inconel xx.xx and Inconel xx.xx.
    - Company verification: The Inconel xx.xx description includes aerospace among its applications; the catalog does not attribute aerospace sales to the company.
85. Conheça a Madiba Metals | Madiba Metals
    - Company verification: Madiba identifies its business as importing and distributing specialty alloys and superalloy raw materials in several commercial forms.
    - Company verification: The company page provides its São Paulo business address.
86. Nosotros
    - Company verification: Roberto Cordes S.A. describes itself as a private Argentine company engaged in importing, stocking, and distributing specialty metals and alloys.
    - Company verification: The company identifies a Buenos Aires warehouse and business address.
87. INCONEL 718 | Roberto Cordes SA
    - Company verification: The company advertises Inconel xx.xx and explicitly lists aerospace turbine-component applications.
    - Company verification: The page lists round-bar or rod stock as an available commercial form, subject to the supplier's availability qualifications.

88. Aeroespacial - Acnis do Brasil - Distribuidor de Materiais Biomédicos em Titânio, Aço Inoxidável, Fio de Nitinol, Fio de Tântalo, Polímeros e Manufatura Aditiva
    - Company verification: ACNIS do Brasil's aerospace page advertises supply arrangements and includes nickel-base alloys among the offered material categories.
    - Company verification: The page identifies ACNIS and Aerometals group relationships and provides a Sorocaba, São Paulo business address.
    - Company verification: Group-level capabilities do not establish Brazilian inventory or completed customer deliveries.
89. a8.png - nickel-alloy table linked from the Aeroespacial page
    - Company verification: The nickel-alloy catalog image linked from the aerospace page lists Alloy xx.xx and Alloy xx.xx with aerospace material specification references.
    - Company verification: This is advertised portfolio evidence, not proof of local stock, flight qualification, or sales.
90. Metal Supplier in Brazil | Titanium Industries
    - Company verification: Titanium Industries identifies a São Paulo sales office on its Brazil location page.
    - Company verification: The page describes specialty-metal supply to aerospace and other markets; it does not establish Brazilian manufacturing.
91. Online Specialty Metal Quotes | Titanium Industries
    - Company verification: The company's commercial quoting catalog offers nickel-alloy xx.xx xx.xx and Waspaloy round bar for aerospace and other applications.
    - Company verification: The catalog establishes an advertised distribution offering, not country-specific shipments.
92. thyssenkrupp Aerospace debuts under its new name tk accelis Supply Chain Solutions at Farnborough International Airshow
    - Company verification: The July xx.xx 2026 announcement states that tk accelis Supply Chain Solutions encompasses the business previously known as thyssenkrupp Aerospace.
    - Company verification: The announcement establishes the current commercial identity used for this discovery; it does not establish completion of a separate ownership transaction.
    - Company verification: The July xx.xx 2026 announcement identifies tk accelis Supply Chain Solutions as thyssenkrupp Aerospace's new name.
    - Company verification: The announcement establishes the legacy-name relationship with tk accelis rather than a separate independent supplier.
93. Steel
    - Company verification: The retained aerospace materials catalog lists Alloy xx.xx and X-xx.xx material forms under aerospace customer specifications.
    - Company verification: This supports an aerospace material-channel role but does not establish Brazilian availability or actual local sales.
94. Multialloy Soluções em Ligas Especiais - 40 anos de inovação - Multialloy - Metais e Ligas Especiais
    - Company verification: The official company profile identifies Multialloy Metais e Ligas Especiais as a specialty-alloy business.
    - Company verification: The profile alone does not establish a named aerospace nickel-superalloy offering.
95. Tubos de Aleaciones Avanzadas - CONUAR
    - Company verification: CONUAR advertises advanced-alloy seamless tubes for aerospace and other industries from Argentina.
    - Company verification: The advertised portfolio includes nickel-family alloys, but the exact aerospace nickel-base superalloy subset remains unresolved.
96. industrias/Aeroespacial | Metalcycle Global
    - Company verification: Metalcycle Global advertises aerospace-material recovery and identifies Inconel xx.xx xx.xx and xx.xx turbine scrap.
    - Company verification: The advertised role is recycling and recovery; the page does not establish primary-alloy production or new-material sales.

97. Our Family Companies - HAPI
    - Company verification: HAPI's family-company material identifies PrecisionWorx as a Puerto Rico contract manufacturer serving aerospace and other sectors.
    - Company verification: The record does not establish a nickel-superalloy material-selling role for PrecisionWorx.
98. Otros componentes aeroespaciales Archives | voestalpine HPM Colombia S.A.
    - Company verification: The Colombian group catalog advertises BÖHLER L718AMS nickel-alloy bars, forgings, and forging stock for aerospace-engine and other applications.
    - Company verification: Country-specific advertising supports a regional marketing channel, not proof of local manufacture or completed shipments.
99. Aplicaciones industriales de la fabricación aditiva | voestalpine HPM Peru
    - Company verification: The Peruvian group site markets aerospace additive-manufacturing services involving nickel-base xx.xx and xx.xx materials and describes BÖHLER-branded material offerings elsewhere in the service portfolio.
    - Company verification: The page describes group capabilities and does not establish local alloy production, sales by the Austrian legal entity, or attributable Peruvian shipments.
100. Aerospace | Deutsche Nickel GmbH, Germany
    - Company verification: Deutsche Nickel GmbH's aerospace page offers high-temperature nickel-alloy semifinished products for aircraft and identifies xx.xx and 80A among typical alloys.
101. Aerospace & Defense | Cogne
    - Company verification: Cogne Acciai Speciali S.p.A. markets aerospace and defense long products in wire rod, bar, and semifinished forms through its mill and distribution network.
102. About Us | Cogne
    - Company verification: Cogne's company description identifies its stainless-steel and nickel-alloy long-product business and development of aerospace and nickel-based product markets.
103. Pétrole & gaz - Cogne France
    - Company verification: Cogne France's oil-and-gas catalog names SN625C and SN718C; this establishes named nickel-alloy catalog presence, not aerospace sales of those grades.
104. Typical Product Guide - Foroni SPA
    - Company verification: Foroni's official product guide identifies a commercial portfolio containing superalloys and nickel/cobalt-based alloys.
105. Quality Management System - Foroni SPA
    - Company verification: Foroni's quality-management page lists AS9100 Rev. D for aviation, space, and defense organizations; the page does not by itself establish a particular aerospace nickel-alloy product.
106. Valbruna Stainless Steel | About us
    - Company verification: Valbruna describes itself as a private company producing stainless steels and nickel alloys, identifies production facilities in Vicenza and Bolzano, and lists aerospace among served industries.
107. Aerospace Steels | Valbruna Australia
    - Company verification: Valbruna's aerospace catalog includes AEROVAL GL3, described as a nickel-base alloy with the N06625 designation.
108. MIMETE | FOMAS Group
    - Company verification: FOMAS identifies MIMETE S.r.l. at Biassono, Italy, as its metal-powder business, offering nickel-base powders and serving aeronautics, space, and defense.
109. MIMETE Metal Powders - Mastering the Science of Metals
    - Company verification: The MIMETE commercial brochure states that FOMAS supplies nickel-based powders for aerospace additive-manufacturing and thermal-spray applications.
110. Downloads - Metalpine
    - Company verification: Metalpine's commercial download catalog lists MET IN718 and MET IN625 nickel-alloy powders and identifies an Austrian business address.

111. Technical Data Sheet - NICKEL BASED: METALPINE IN718
    - Company verification: Metalpine GmbH's MET IN718 product sheet identifies aircraft-engine and liquid-fueled-rocket applications for the named nickel-alloy offering.
112. Nickel Alloys for Industrial 3D Printing | EOS GmbH
    - Company verification: EOS markets nickel-alloy powders including IN718, IN625, HX, IN939, and HAYNES xx.xx and explicitly identifies aerospace gas turbines among applications.
113. Aerospace Alloys - NeoNickel
    - Company verification: NeoNickel's aerospace page markets an inventory that includes nickel alloys alongside other aerospace material families.
114. NeoNickel - For all your metal alloy solutions
    - Company verification: NeoNickel describes a European supplier and processing network with United Kingdom locations and bases in the Czech Republic, France, Germany, and Italy.
115. Alloy 718 is the Go-To Material in Aerospace Applications - NeoNickel
    - Company verification: NeoNickel specifically promotes sourcing aerospace-grade Alloy xx.xx through its commercial business.
116. Nickel Based Alloys | Nickel Based Superalloys
    - Company verification: Smiths Metal Centres advertises a nickel-based alloy and superalloy stock range supported by a United Kingdom service-center network.
117. Aerospace Alloys - Smiths Metal Centres
    - Company verification: Smiths Metal Centres' aerospace page includes nickel materials within its aerospace raw-material supply offering.
118. High Performance Alloys - Zapp Precision Metals GmbH
    - Company verification: Zapp Precision Metals GmbH's brochure offers nickel and other high-performance alloys in semifinished forms, identifies aerospace among served industries, and describes a commercial relationship with Haynes International.
119. Metallpulver: Handel, Herstellung & Werkstoffqualifizierung
    - Company verification: Rosswag Engineering publicly offers commercial metal-powder trading and related powder services; exact aerospace nickel-grade participation remains unresolved.
120. Edelstahl Rosswag & Rosswag Engineering: Tradition & Innovation
    - Company verification: Rosswag's company page connects Edelstahl Rosswag and Rosswag Engineering within the German business, rather than establishing two independent participants.
121. m4p material solutions | metals for printing - Shop
    - Company verification: m4p operates a public commercial metal-powder webshop; this inspected record does not independently establish a named aerospace nickel-superalloy sale.
122. High Pressure Seamless Tubing for Aerospace - Fine Tubes
    - Company verification: Fine Tubes markets aerospace nickel-alloy tubing and lists Alloy xx.xx X750, xx.xx xx.xx and xx.xx within its aerospace materials offering.
123. Frequently questions about tubing products and services - Fine Tubes
    - Company verification: Fine Tubes identifies its manufacturing mill in Plymouth, England, AMETEK ownership, and sales to both end users and stockists.
124. About us - DNIPROSPETSSTAL
    - Company verification: DNIPROSPETSSTAL's official English company description establishes a Ukrainian specialty-steel and alloy business with aerospace among served industries; it does not isolate nickel-base aerospace products.
125. CPP Poland | Consolidated Precision Products
    - Company verification: CPP's Polish operation identifies aerospace casting activity involving nickel and cobalt superalloys, supporting a regional component role rather than proving external alloy-material sales.

126. Additive Manufacturing Metal Powders - ECKART
    - Company verification: ECKART's commercial powder page identifies ECKART TLS and markets aluminum, titanium, copper, and other powder offerings; the inspected overview does not establish a named aerospace nickel-superalloy product.
127. BGH Edelstahl Freital auf Kurs zur Luftfahrtzulassung
    - Company verification: BGH's Freital notice states that the operation is pursuing EN xx.xx certification and had completed an initial audit stage; this is not a statement of completed certification.
128. Элементы кольца типы профилей - Русполимет
    - Company verification: Ruspolymet maintains an official Russian ring-product catalog; the retrieved record did not resolve its current named nickel-base aerospace material portfolio.
129. Quienes somos - NICKEL ALLOYS
    - Company verification: The Spanish Nickel Alloys brand describes a commercial business supplying nickel-based welding consumables and references aerospace-grade offerings.
130. Productos - NICKEL ALLOYS
    - Company verification: Nickel Alloys' product catalog lists xx.xx xx.xx xx.xx and other nickel-alloy welding consumables; the catalog does not establish the legal selling entity or aerospace-only sales.
131. TEI ALLOYS - About Us
    - Company verification: TEI Alloys identifies itself as a Turkish superalloy and advanced-metal business with operations in Istanbul and Izmir.
    - Company verification: The company states that it is a wholly owned subsidiary of TUSAŞ Engine Industries and offers nickel- and cobalt-based superalloys.
132. TEI ALLOYS - Superalloys
    - Company verification: TEI Alloys describes commercial supply of superalloys for aviation and aerospace applications.
    - Company verification: Its published commercial category includes nickel-based superalloys and named alloy families.
133. Varzene Metal - Corporate
    - Company verification: Varzene Metal describes nickel-based superalloy production and semifinished material offerings for aviation and other industries in Turkey.
    - Company verification: Its corporate history states that a partnership ended in 2024; legal succession and allocation of historical operations require corroboration.
134. PURESPHERE - Gas atomized metal powders for additive manufacturing
    - Company verification: PURESPHERE identifies itself as Sentes-BIR's additive-manufacturing powder line and includes nickel superalloys.
    - Company verification: The supplier identifies production in Izmir, Turkey, and describes aerospace-grade powder offerings.
135. AEROSPACE AND SPACE Solutions | Hiperoy
    - Company verification: Hiperoy advertises supply of nickel-based alloys for aerospace and space applications.
    - Company verification: The page lists its headquarters in Istanbul, Turkey.
136. Kuzp İleri Teknolojik Metaller - Germanyum, Galyum, İndiyum, Rutenyum, Renyum, Hafniyum
    - Company verification: Kuzp describes a materials-supply business that includes superalloys and serves aerospace and space sectors.
137. Nickel Base Alloys
    - Company verification: Kuzp publishes a nickel-based superalloy product category with jet-engine and spacecraft applications.
    - Company verification: The inspected page does not establish a currently available named grade or an aerospace delivery.

138. Nickel Alloys - NORM 3D
    - Company verification: NORM 3D lists EOS nickel-alloy powders including IN718, IN939, HX, and HAYNES xx.xx with aerospace applications.
    - Company verification: The page identifies NORM 3D as an official EOS distributor in Turkey.
139. Metal Powder Supplier for Additive Manufacturing in Türkiye | PRODA METAL
    - Company verification: PRODA METAL identifies Proda Industrial Design as the business behind its Turkish powder-supply channel.
    - Company verification: The commercial catalog lists Inconel xx.xx Inconel xx.xx and Hastelloy X powders and describes access to Turkish aerospace additive-manufacturing users.
140. AZOBEX
    - Company verification: AZOBEX describes a Turkish metal-powder business serving aerospace and other advanced industries.
    - Company verification: Its stated portfolio includes nickel-superalloy powders; named commercial grades and deliveries are not established by this page.
141. SCOPEMETALS GROUP
    - Company verification: Scope's own aerospace materials catalog identifies a metals-distribution business, includes nickel alloys, and lists its main office and warehouses in Israel.
    - Company verification: The catalog describes an Israel Aerospace Industries supply relationship, but does not establish the current nickel-superalloy grade subset.
142. Scope Worldwide - Scope Metals
    - Company verification: Scope's current location page identifies its head office and distribution center in Bne Ayish, Israel.
    - Company verification: The page presents Scope Metals Group and its distribution subsidiaries as a group rather than separate additional local manufacturing businesses.
143. Aerospace-Grade Raw Materials | B&S Aircraft Alloys
    - Company verification: B&S Aircraft Alloys advertises aerospace raw-material distribution and direct mill relationships.
    - Company verification: Its business pages list Israel among international sales-office locations; this is a channel presence, not evidence of Israeli alloy manufacturing.
144. AMMatz Group | AM Metal Powder Production
    - Company verification: AMMatz Group advertises metal-powder production in Israel and includes nickel-based superalloys in its portfolio.
    - Company verification: The inspected page does not establish a named aerospace offering or customer.
145. Non-Polymeric3D | Metallic and ceramic feedstocks Additive Manufacturing | Kibbutz Shomrat, Israel
    - Company verification: Non-Polymeric3D advertises metallic feedstocks including Inconel xx.xx and Inconel xx.xx and lists aerospace among potential industries.
    - Company verification: The company presents an Israeli business location and prototype examples; these do not establish flight qualification or recurring aerospace sales.
146. Nickel Alloy Supplier UAE | Inconel, Monel, Hastelloy | Nifty Alloy
    - Company verification: Nifty Alloys LLC advertises nickel-alloy stock, including Inconel xx.xx and Hastelloy X, from the UAE.
    - Company verification: The page identifies aerospace applications and advertised delivery coverage across the GCC.
147. Nickel Alloys - Icon Steel
    - Company verification: Icon Steel advertises Dubai-stocked nickel-alloy materials, including Inconel xx.xx in multiple material forms.
    - Company verification: The page links the nickel-alloy offering to aerospace applications; manufacturing ownership and actual aerospace shipments are not independently established.

148. NICKEL ALLOYS REGULAR AND FINE WIRE - Novametal Middle East
    - Company verification: Novametal Middle East publishes a nickel-alloy wire offering with aerospace and aeronautical applications.
    - Company verification: The page describes a UAE trading business but does not establish the exact nickel-superalloy grades or its parent-company relationship.
149. High Nickel Plates & Sheets | AL LIWARA General Trading LLC:
    - Company verification: A page under the AL LIWARA General Trading LLC name advertises high-nickel plates and sheets, including Inconel xx.xx and references aerospace applications.
    - Company verification: The page identifies a Dubai address and GCC export coverage; legal registration and actual aerospace transactions remain uncorroborated.
150. Wayma Powders - High-Performance Coating Solutions
    - Company verification: WAYMA Powders advertises nickel-based thermal-spray powders and aerospace applications.
    - Company verification: The company describes a UAE logistics hub, but the inspected portfolio does not establish an in-boundary structural nickel-superalloy grade.
151. Nickel Alloy Supplier Qatar | Inconel, Hastelloy, Monel | Project Steels DMCC
    - Company verification: Project Steels & Piping DMCC advertises nickel-alloy supply from Dubai to Qatar, including Inconel xx.xx in material forms.
    - Company verification: The page identifies aerospace as an application of the listed grade, while its named Qatar project context is primarily industrial.
152. High Temperature Nickel Alloys Supplier UAE & Asia | Steelinox
    - Company verification: Steelinox markets high-temperature nickel alloys, including Alloy xx.xx for UAE and Asian customers.
    - Company verification: Its business description includes aerospace among served industries; this does not establish aerospace-specific UAE deliveries or local manufacturing.
153. About Nickel Alloy Metals & Machinery | Nickelalloyme
    - Company verification: Nickel Alloy Metals & Machinery W.L.L. describes a Bahrain-based specialty-material business offering heat-resistant and corrosion-resistant materials.
    - Company verification: Its business page identifies coverage across Bahrain, Saudi Arabia, Kuwait, Qatar, the UAE, and Oman.
154. Alloys Nickel Marketing Consultancy
    - Company verification: Nickel Marketing Consultancy publishes a high-temperature alloy portfolio that includes Nickel xx.xx and aerospace applications.
    - Company verification: The portfolio page lists a Bahrain office, but does not establish whether the business sells, represents, or only markets the materials.
155. □□□ | □□□□ □ □□□□ □□□□□ □□□□□ □□□□ □ □□□□□ □□□□
    - Company verification: The Persian-language business page branded □□□ □□□□□□ □□□□ advertises alloy and nickel-superalloy powders in Iran.
    - Company verification: The offering includes Inconel xx.xx and Inconel xx.xx powder categories and aerospace application references; legal identity and actual aerospace sales remain unverified.
156. About - Olwan Nickel Alloys
    - Company verification: Olwan Nickel Alloys describes itself as a high-nickel-alloy manufacturer and supplier in Amman, Jordan.
    - Company verification: Its company page identifies aerospace among served industries, but does not resolve a specific currently available aerospace nickel-superalloy material.
157. About Multi Alloys and Our Expertise | Multi Alloys
    - Company verification: Multi Alloys identifies itself as a South African specialty-alloy supplier established in 1997.
    - Company verification: The company states that it joined Energy Metals and Energy Valves under EMVAfrica.

158. Nickel Based Alloys for Demanding | Multi Alloys
- Company verification: The Johannesburg supplier's catalog lists Alloy xx.xx as imported material available through stock or mill availability.
- Company verification: The page discusses aerospace uses of nickel alloys, but its Hastelloy X entry contains an inconsistent grade designation and is not relied on for exact grade classification.

159. Rolls-Royce partners with Avalloy, South Africa's first superalloy producer | Rolls-Royce
- Company verification: On May xx.xx 2007, Rolls-Royce announced an agreement with Avalloy and described its involvement in establishing the Pelindaba facility.
- Company verification: This is historical customer-relationship evidence, not proof of current operation or ownership.

160. National Industrial Participation Programme Report 2007
- Company verification: The South African government's 2007 industrial-participation report identifies Avalloy's mostly nickel-based superalloys for the aeronautical industry.
- Company verification: The report records integration into Rolls-Royce's international aviation supply chain during that historical period.

161. Ailing assets of Strategic Growth Fund revealed - International Adviser
- Company verification: A June xx.xx 2014 report describes Advanced Vacuum Alloys as formerly Avalloy.
- Company verification: The dated report concerns funding difficulties and supports only a historical name-continuity lead, not current legal or operating status.

162. INCONEL 718 - Technical Datasheet AWS 013 Rev.2
- Company verification: Alloy Wire International's INCONEL xx.xx commercial datasheet lists wire formats and bars or lengths.
- Company verification: The datasheet identifies aerospace-related applications including rocket motors and spacecraft; the document carries a 2016 copyright.

163. South Africa - Alloy Wire International
- Company verification: The supplier publishes a South Africa contact page.
- Company verification: The page establishes a country-addressed commercial contact route, not proof of a local manufacturing site or completed shipments.

164. Discover Our Global Presence at thyssenkrupp Aerospace
- Company verification: The official location directory identifies thyssenkrupp Aerospace Tunisia as a division of thyssenkrupp Materials France S.A.S.
- Company verification: It provides an operating address in Fouchana, Tunisia.

165. Home - Nabil Nickel Alloys
- Company verification: The retrieved catalog landing page identifies Nabil Nickel Alloys as a high-nickel-alloy business in Tunis, Tunisia.
- Company verification: It advertises Inconel product families, including pipes; it does not establish a named aerospace superalloy grade or local sales.

166. TUBES - aramco 2000
- Company verification: Armco 2000 Group identifies its business as based in Egypt.
- Company verification: Its tubes page lists aerospace tubes and nickel-alloy materials separately, without establishing a named aerospace nickel-superalloy product.

167. Alliages de Nickel - Tubes, tôles, brides, accessoires
- Company verification: Metalyns advertises nickel-alloy products including Inconel xx.xx and discusses aeronautical applications.
- Company verification: The company states delivery coverage in North Africa, including Egypt, Tunisia, Algeria and Morocco; this is an offered supply route rather than independently observed sales.

168. Aerospace Engine Components | Pursuit Aero
    - Company verification: Pursuit Aerospace describes its business as manufacturing complex aircraft-engine components.
    - Company verification: The business page identifies Tunis, Tunisia among its operating locations; it does not establish a separate alloy-material selling role.
169. Nexteam Sousse usinage | Site industriel aéronautique
    - Company verification: Nexteam's Sousse business page identifies the Tunisian operation, formerly Ventana Meca, and lists Inconel among its material capabilities.
    - Company verification: The page describes aerospace component activities, including engine-related assemblies, rather than a mill-product or powder catalog.
170. Aerospace Industry Support Initiative Impact Report 2023/24
    - Company verification: The 2023/xx.xx public aerospace-support report identifies Metal Heart as a Gauteng additive-manufacturing business.
    - Company verification: It connects the company's aerospace supplier-development work to Inconel xx.xx components, while describing development and commercialization activity rather than an alloy-material sales portfolio.
171. Home | Daliff Precision Engineering (Pty) Ltd
    - Company verification: Daliff Precision Engineering's business page identifies aerospace component activity and Inconel among the materials it handles.
    - Company verification: The page provides a Cape Town business address and displays the company name Daliff Precision Engineering (Pty) Ltd.
172. Markets - Aérostructures
    - Company verification: Aviagroup Industries' aviation markets page describes component offerings using Inconel alongside other metals.
    - Company verification: The page connects the group to operations in France and Morocco, but does not isolate Moroccan nickel-alloy material sales.
173. Aerospace Archives - BÖHLER South Africa
    - Company verification: BÖHLER's South African aerospace page advertises steel and nickel-alloy supply for aerospace applications.
    - Company verification: The page identifies a Johannesburg contact and voestalpine High Performance Metals Africa (PTY) Ltd, supporting a regional channel for the existing producer identity rather than a new supplier row.
174. Company Profile-LONGDA
    - Company verification: The official profile identifies Jiangsu Longda Superalloy Co., Ltd. and describes its superalloy business serving aero-engine applications in China. ([en.wxlongda.com](https://en.wxlongda.com/about.html))
175. 变形高温合金-江苏隆达超合金股份有限公司
    - Company verification: Longda's commercial wrought-superalloy catalog lists nickel-alloy material products, including Nimonic xx.xx and Inconel xx.xx equivalents. ([wxlongda.com](https://www.wxlongda.com/products_details/xx.xx.html))
176. 中和上大航空材料股份有限公司 2026 年半年度报告全文
    - Company verification: The 2026 interim filing records the change to Zhonghe Shangda Aeronautic Materials Co., Ltd., registered on May xx.xx 2026, and describes commercial nickel-base superalloys among its aerospace-related material products. ([disc.static.szse.cn](https://disc.static.szse.cn/download/disc/disk03/finalpage/2026-xx.xx-xx.xx/6e958130-69ab-xx.xx-812b-6812e79187f0.PDF))
177. BLT2023 Technological Achievements Overview
    - Company verification: The official business announcement identifies Xi'an Bright Laser Technologies Co., Ltd. and describes the release of BLT-In738 material for aerospace-engine and gas-turbine applications. ([xa-blt.com](https://www.xa-blt.com/en/news/blt2023-technological-achievements-overview/))

178. Next-level production at TCT Asia 2025

· Company verification: The April xx.xx 2025 company announcement presents BLT-K438/In738 as a nickel-base superalloy offering for aerospace and energy applications. ([xa-blt.com](https://www.xa-blt.com/en/news/next-level-production-at-tct-asia-2025/))

179. About Us - Avimetal

· Company verification: The official profile identifies Avimetal AM Tech Co., Ltd., its Beijing business presence, metal-powder manufacturing role and JCMEH affiliation. ([avimetaladditive.com](https://www.avimetaladditive.com/about-us/))

180. Aerospace - Avimetal

· Company verification: Avimetal's aerospace business page offers named superalloy powders including In718, In625 and Hastelloy X as part of its aerospace materials portfolio. ([avimetaladditive.com](https://www.avimetaladditive.com/aerospace/))

181. PREP, Metal Powder, Event Wholesale

· Company verification: The official profile identifies Xi'an Sino-Euro Materials Technologies Co., Ltd. and states its affiliation with the Northwest Institute for Non-ferrous Metal Research. ([en.c-semt.com](https://en.c-semt.com/about-us/))

182. PREP, Metal Powder, HIP, Titanium, Nickle Supplier China

· Company verification: Sino-Euro's industry page expressly offers nickel superalloys for aerospace and aviation customers. ([en.c-semt.com](https://en.c-semt.com/solution/industry/))

183. SS-PREP® GH4169 Alloy Powder by Sino-Euro

· Company verification: Sino-Euro advertises GH4169 alloy powder, identified as Inconel xx.xx within its commercial powder portfolio. ([en.c-semt.com](https://en.c-semt.com/new-products/SS-PREP%C2%AE%20GH4169%20Alloy%20Powder%20by%20Sino-Euro.html))

184. Products | IHI Master Metal Co.,Ltd.

· Company verification: IHI Master Metal offers nickel- and cobalt-base superalloy ingots for casting turbine blades used in aviation engines and supplies customers domestically and overseas. ([ihi.co.jp](https://www.ihi.co.jp/imm/en/products/index.html))

185. About IMM | IHI Master Metal Co.,Ltd.

· Company verification: The official company record identifies IHI Master Metal's Japanese legal business, Aioi location and IHI ownership. ([ihi.co.jp](https://www.ihi.co.jp/imm/en/company/office/index.html))

186. Metal Powders and Powder Metallurgy Products | Products | Sanyo Special Steel Co., Ltd.

· Company verification: Sanyo Special Steel's official product page establishes a Japanese metal-powder supplier and lists Alloy C276 powder-metallurgy products. This alone does not establish an aerospace-specific nickel grade. ([sanyo-steel.co.jp](https://www.sanyo-steel.co.jp/english/product/metallic_powder/))

187. Metal Powders and Powder Metallurgy Products - Sanyo Special Steel product catalog

· Company verification: Sanyo's official metal-powder brochure includes aerospace among the applications addressed by its powder business; the inspected passage does not bind a named nickel grade to an aerospace customer. ([sanyo-steel.co.jp](https://www.sanyo-steel.co.jp/english/product/metallic_powder/images/pdf/metallic_powder2211.pdf))

188. SeAH CSS - Aerospace & Defense

· Company verification: SeAH's aerospace page states that it manufactures and supplies aerospace-component materials and lists grades including N07718, N07738 and N07001. ([seahcss.co.kr](https://www.seahcss.co.kr/eng/application/aerospace.asp))

189. Management System Certificate - SeAH Changwon Integrated Special Steel Corporation

· Company verification: The posted management-system certificate identifies SeAH Changwon Integrated Special Steel Corporation and its Korean manufacturing scope covering special steel and superalloy bars, tubes, wire rods and forged products. ([seahcss.co.kr](https://www.seahcss.co.kr/UploadFile/%5BQMS%5D%20ISO%xx.xx%28UKAS%xx.xx%xx.xx~2027.pdf))

190. Powder Reference - INDO-MIM

· Company verification: INDO-MIM advertises nickel-superalloy powders including IN718, IN713C, IN625 and CM247, identifies aerospace applications and reports powder supply to Indian and overseas customers. Product-approval statements remain supplier-reported.
([indo-mim.com](https://www.indo-mim.com/powder-reference/))

191. AS9100:2016 Certificate - INDO-MIM Limited

· Company verification: The posted AS9100 certificate identifies INDO-MIM Limited at Doddaballapur, India, and includes manufacture of metal powder for aerospace applications in its stated scope.
([indo-mim.com](https://www.indo-mim.com/wp-content/uploads/2025/xx.xx/AS-xx.xx-Aero-MIM-DBP.pdf))

192. Taiwan Aerospace Industry Association - Member Address

· Company verification: The association's member directory identifies Transcrystal Alloy Industrial Corp. in Taiwan and lists vacuum investment castings in aerospace-grade nickel-base superalloys.
([taia.org.tw](https://www.taia.org.tw/en/member.asp))

· Company verification: The association's member directory identifies Super Pioneer Technology LTD. in Taiwan and lists vacuum investment castings in aerospace-grade nickel-base superalloys.
([taia.org.tw](https://www.taia.org.tw/en/member.asp))

193. About TCA | Taiwan Superalloy Foundry Since 1984

· Company verification: Transcrystal's official overview describes a Taiwan superalloy foundry offering nickel-base alloy products and serving aerospace among several industries.
([tcaic.com](https://tcaic.com/en/about-tca/overview/))

194. Metal Powder Manufacturer, Supplier & Exporter | Additive Manufacturing & HIP Grades - Dipti Metal Industries

· Company verification: Dipti Metal Industries' commercial catalog advertises nickel-superalloy powders including Alloy xx.xx xx.xx and X/HX for aerospace-related material applications. Own manufacture and actual aerospace shipments are not independently established.
([diptimetal.com](https://www.diptimetal.com/manufacturer-exporter-supplier/metal-powder))

195. Gas Turbine Products - ROLEX ALLOYS INTERNATIONAL

· Company verification: Rolex Alloys International advertises a stockholding and distribution role for superalloy ingot and master-alloy stock, including IN718, serving aerospace and other turbine markets.
([rolexalloys.com](https://www.rolexalloys.com/sdp/xx.xx/xx.xx/cp-xx.xx/xx.xx/Gas_Turbine_Products.html))

196. Aerospace - Rolled Alloys Singapore

· Company verification: Rolled Alloys' Singapore aerospace catalog offers nickel alloys including xx.xx xx.xx Alloy X and xx.xx for aviation and space-related applications.
([rolledalloys.com.sg](https://www.rolledalloys.com.sg/markets/aerospace/))

197. Nickel Alloys - Inconel® - Titanium Metal Supply

· Company verification: Titan Engineering Pte Ltd identifies its Singapore business and advertises distribution of nickel-alloy sheet, plate and bar, including Inconel xx.xx and xx.xx for aerospace and other industries.
([titanium.com.sg](https://titanium.com.sg/portfolio/nickel-alloys-inconel-monel/))

198. HH Special Metal - HH Group | Sustainability for the Next Generation

· Company verification: HH Special Metal's official business page describes a Singapore distribution business serving aerospace and oil-and-gas customers, its former SG Specialty Metals name and HH Group affiliation. It does not establish a named aerospace superalloy grade.
([honghock.com.sg](https://www.honghock.com.sg/hh-special-metal/))

199. Inconel 625 | Nickel Alloy 625 | Alloy 625 | UNS N06625 | Nickel Alloy Supplier | E Steel Sdn Bhd

· Company verification: E Steel Sdn Bhd's Malaysian product catalog offers Inconel xx.xx and identifies aerospace among its applications. The listing establishes an advertised channel offering, not actual aerospace sales or own manufacture.
([esteelsuppliers.com.my](https://www.esteelsuppliers.com.my/product/inconel-xx.xx-nickel-alloy-xx.xx-alloy-xx.xx-uns-n06625-nickel-alloy-supplier))

200. thyssenkrupp Aerospace in Australia
    - Company verification: thyssenkrupp Aerospace's Australian business page identifies its local distribution operation, lists nickel alloys including xx.xx and xx.xx and states that it serves aerospace customers in Australia and New Zealand. ([thyssenkrupp-aerospace.com](https://www.thyssenkrupp-aerospace.com/en/company/locations/australia))
201. Nickel alloys from Revolution Materials
    - Company verification: Revolution Materials' Australian catalog advertises nickel alloys including xx.xx and X-xx.xx under aerospace-alloy offerings and states that it sources multiple material forms. ([revolutionmaterials.com.au](https://www.revolutionmaterials.com.au/nickel.php))
202. Nickel Alloys & High Performance Alloys Datasheet
    - Company verification: Austral Wright Metals publishes a nickel-alloy supplier catalog identifying aerospace components, combustion and ducting systems, fuel nozzles and afterburners among typical applications. ([australwright.com.au](https://www.australwright.com.au/alloys-datasheet/))
203. Additional Investment in Alloyed Ltd. — Promoting collaboration with Oxford University startups in the advanced materials field —
    - Company verification: The November xx.xx 2024 announcement identifies Alloyed Ltd. and JX's additional investment in the U.K. alloy-design business.
    - Company verification: JX Advanced Metals announces its own additional investment in Alloyed and related business collaboration.
204. TCT Magazine: Putting the super in superalloy | Alloyed
    - Company verification: Alloyed promotes its ABD-900AM nickel-superalloy product for aerospace and turbomachinery and describes its commercial launch in 2020.
205. Metal Powders by Aubert & Duval
    - Company verification: The commercial powder brochure lists nickel superalloys ABD-900AM and ABD-1000AM and identifies ABD as an Alloyed trademark.
    - Company verification: Aubert & Duval advertises nickel-superalloy powders for aeronautics and space alongside its other served industries.
206. Continuum Powders and INDO-MIM Inc Achieve Qualification of Ni718 for Binder Jet Production
    - Company verification: Continuum's October xx.xx 2025 announcement identifies OptiPowder Ni718 and reports qualification by the U.S. business INDO-MIM Inc.
    - Company verification: The announcement connects this commercial powder program to aerospace and other high-performance applications; it does not establish flight authorization.
207. Continuum Powders Reports Major Nickel and Titanium Production Gains, Advances Houston Expansion and Process Automation
    - Company verification: The October xx.xx 2026 company release states that Continuum produces OptiPowder Ni718 through its Houston operations.
208. ABD®-900AM New Nickel Powder for Additive Manufacture (Alloyed) | Special Site of JX Advanced Metals
    - Company verification: JX's product site advertises Alloyed's ABD-900AM nickel powder and names aerospace and space among its applications.
    - Company verification: The partner catalog attributes the advertised ABD-900AM product to Alloyed.
209. AP&C's Metal Powder Products | MORIMURA BROS., INC.
    - Company verification: Morimura describes itself as a sales outlet for AP&C metal powders in Japan and Korea and links AP&C's nickel-alloy portfolio.
    - Company verification: Morimura identifies AP&C as its represented powder supplier and describes aerospace among the supplier portfolio's served industries.
210. Ni Alloy 718: Nickel Based Alloy | AP&C
    - Company verification: AP&C directly advertises a Ni Alloy xx.xx powder product for additive-manufacturing and other powder-market applications.
211. LaserForm Ni718 (A) | 3D Systems
    - Company verification: 3D Systems offers LaserForm Ni718 (A) and lists aircraft gas-turbine engine and liquid-fueled rocket components among its applications.

212. Aerospace & Defense | GKN Powder Metallurgy
    - Company verification: GKN Powder Metallurgy's aerospace portfolio advertises Ancor AM IN xx.xx nickel-superalloy powder.
    - Company verification: The site states that Dauch Corporation acquired Dowlais and its subsidiaries, including GKN Powder Metallurgy, on February xx.xx 2026.
213. Aerospace - S-Tech Corp.
    - Company verification: S-Tech's aerospace catalog advertises nickel-alloy ingots and round bars, including xx.xx xx.xx X-xx.xx and C263.
214. List of major shareholders - S-Tech Corp.
    - Company verification: S-Tech's March xx.xx 2025 shareholder disclosure names Gloria Material Technology Corp. as a shareholder.
    - Company verification: The shareholder disclosure corroborates the Gloria Material Technology Corp. identity and its dated investment relationship with S-Tech.
215. About - Advanced Alloy Services
    - Company verification: Advanced Alloy Services describes buying, selling, and processing high-temperature alloys for aerospace and other industries.
216. Superalloys, Advanced Alloy Services Ltd. Sheffield
    - Company verification: The company's buy-and-sell superalloy catalog lists Alloy xx.xx Alloy xx.xx C263, Waspaloy, PWA1484, CMSX4, and other named alloys.
217. Advanced Revert supplier of high temperature metals and superalloy revert to a global market
    - Company verification: The business announcement identifies Advanced Revert LLC as a U.S. joint venture intended to offer certified superalloy revert and management services.
    - Company verification: Advanced Alloy Services Ltd. is identified as one of the joint-venture partners.
    - Company verification: Revert Alloys & Metals Ltd. is identified as the other joint-venture partner; its direct current product portfolio is not established by this announcement.
218. Inconel® 718 | Central Wire
    - Company verification: Central Wire advertises Inconel xx.xx in wire and related material formats and explicitly identifies aerospace applications.
219. Central Wire Cold Heading Wire Brochure
    - Company verification: Central Wire's brochure advertises aerospace-quality wire and bar stock, lists nickel alloys including xx.xx xx.xx and X750, and identifies Canadian, U.S., and U.K. locations.
220. Metal additive manufacturing
    - Company verification: Renishaw's commercial brochure identifies supplied nickel-alloy powders including INCONEL xx.xx-xx.xx and xx.xx-xx.xx.
    - Company verification: The brochure establishes a powder-supply role alongside its equipment business, not independent manufacture of every powder.
221. Data sheets - Additive manufacturing
    - Company verification: Renishaw's public data-sheet catalog lists In718-xx.xx powder as a supplied material offering.
222. Aerospace Tubing and Extrusions Supplier | Plymouth®
    - Company verification: Plymouth's aerospace catalog advertises nickel-alloy tubing, including grades xx.xx and xx.xx.
223. PX PRECIMET - PX Group
    - Company verification: PX Group identifies PX Précimet as a precision-profile and tube business working with nickel alloys and serving aerospace customers.
    - Company verification: The inspected business page does not establish a named nickel-base superalloy grade.
224. MSE PRO Hastelloy X Nickel Based Powder for Additive Manufacturing
    - Company verification: MSE Supplies LLC offers MSE PRO Hastelloy X nickel-based powder through its commercial catalog and identifies aerospace and aviation-turbine applications.

225. Aerospace tubes - Alleima
    - Company verification: Alleima's aerospace tubing catalog explicitly lists nickel Alloys xx.xx and xx.xx.
226. Nickel-Alloy-Distributor - ASM Aerospace Specification Metals
    - Company verification: ASM's inspected nickel-distributor catalog contains named aerospace nickel-alloy offerings, including Alloy xx.xx and Waspaloy.
227. Locations | Howmet Aerospace
    - Company verification: Howmet's United Kingdom location record identifies nickel-based alloys among products at its Tamworth Engineered Structures operation.
228. 抚顺特殊钢股份有限公司 2025 年年度报告
    - Company verification: The 2025 annual report identifies the listed issuer as Fushun Special Steel Co.,LTD., confirms its official website, and describes continuing aerospace-related superalloy business. It does not establish a named current nickel-base aerospace grade. ([dataclouds.cninfo.com.cn](https://dataclouds.cninfo.com.cn/shgonggao/hsomarket/2026/xx.xx/58b4e684255c46c69bd844e2edcfc4a3.PDF))
229. Lieferprogramm - BGH Edelstahlwerke GmbH
    - Company verification: BGH's 2023 supply-program brochure identifies BGH Edelstahlwerke GmbH and describes an owner-managed nickel-alloy long-product business. The brochure does not resolve a named aerospace nickel-superalloy offering. ([bgh.de](https://bgh.de/media/0c/xx.xx/xx.xx/xx.xx/BGH_Folder_Lieferprogramm_2023_de.pdf))
230. Locations | Ellwood
    - Company verification: ELLWOOD's current location directory lists Ellwood Quality Steels & Alloys at its New Castle, Pennsylvania business location. This improves operating-identity support but does not establish a named aerospace nickel-superalloy product.
231. Detail by Officer/Registered Agent Name - ASM Aerospace Specification Metals, Inc.
    - Company verification: Florida's corporate registry identifies ASM Aerospace Specification Metals, Inc. as active under document number P02000037832. It is a distinct registered corporation from American Special Metals, Corp.; the record does not establish ultimate ownership. ([search.sunbiz.org](https://search.sunbiz.org/Inquiry/CorporationSearch/SearchResults?Detail=FL.DOS.Corporations.Shared.Contracts.FilingRecord&InquiryDirectionType=ForwardRecord&InquiryType=OfficerRegisteredAgentName&ListNameOrder=LAMETGPLLC+A090000008441&SearchNameOrder=LAMETIRALPHG+F180000003961&SearchTerm=Lamet+Gp%2C+Llc))
232. Detail by Entity Name - American Special Metals, Corp.
    - Company verification: Florida's corporate registry identifies American Special Metals, Corp. as active under document number P09000036941, with a separate registration and business address from ASM Aerospace Specification Metals, Inc. Separate registration does not establish unrelated beneficial ownership. ([search.sunbiz.org](https://search.sunbiz.org/Inquiry/CorporationSearch/SearchResultDetail?aggregateId=domp-p09000036941-9db77895-44c6-4b98-8fc0-2a95810f86b2&directionType=ForwardList&inquirytype=EntityName&listNameOrder=AMERICANSPECIALIZEDTOURS+xx.xx&searchNameOrder=AMERICANSPECIALMETALS+P090000369410&searchTerm=AMERICAN+SPARKS+LLC))
233. About ASM Aerospace Specification Metals Inc.
    - Company verification: ASM's own business page identifies ASM Aerospace Specification Metals, Inc. and its aerospace-material stockholding, distribution, preprocessing, and export roles.
234. Superalloy Products - Mishra Dhatu Nigam Limited
    - Company verification: MIDHANI's inspected commercial brochure identifies Mishra Dhatu Nigam Limited, advertises aerospace and space applications, and lists Superni xx.xx and Superni xx.xx among its named offerings. The document is hosted in a 2020 directory and does not establish present grade-level availability. ([midhani-india.in](https://midhani-india.in/WordPress-content/uploads/2020/xx.xx/MIDHANI%20Super%20Alloys%20Brochure.pdf))

235. Aerospace Supplier of Stainless Steel, Aluminum, Nickel & Titanium

· Company verification: A. M. Castle's current aerospace-business page identifies Castle Metals Aerospace as its division and advertises nickel-alloy material offerings including xx.xx xx.xx and X-xx.xx. The page establishes a global aerospace-material channel, not Moroccan grade availability. ([amcastle.com](https://www.amcastle.com/castle-metals-aerospace/))

236. History - A. M. Castle & Co.

· Company verification: A. M. Castle's business history links the Castle Metals name to A. M. Castle & Co., records its May xx.xx 2023 acquisition by MiddleGround Capital, and describes the subsequent combination with Banner Industries.

237. Metal Powder for Additive Manufacturing - 6K Additive

· Company verification: 6K Additive's current commercial powder catalog explicitly offers Nickel Ni718 and Nickel Ni625 powders and identifies aerospace among its served industries. This improves the inherited marketed-portfolio gap without establishing completion of any customer qualification. ([6kadditive.com](https://6kadditive.com/metal-powder-for-additive-manufacturing/))

238. 6K Additive Secures A$48 Million Through Initial Public Offering on the Australian Stock Exchange

· Company verification: 6K Additive's December xx.xx 2025 announcement identifies 6K Additive, Inc. and reports completion of its ASX initial public offering under ticker 6KA. Planned expansion in that announcement is not counted as completed capacity.

239. 6K Additive and Cumberland Additive Announce Partnership and Sign Long Term Supply Agreement for Nickel 718

· Company verification: The May xx.xx 2023 company announcement records a long-term agreement to supply Ni718 powder to Cumberland Additive. It supports a dated external-customer relationship, not aerospace-only shipments or current agreement volumes.

240. Inconel 718 Supplier and Stockist - Bhansali AeroAlloys

· Company verification: Bhansali AeroAlloys publicly advertises an Inconel xx.xx supplier and stockist offering. This establishes a named commercial-channel lead, not independent leadership, actual aerospace deliveries, or verified ownership.

241. Superalloy Products | SeAH Superalloy Technologies

· Company verification: SeAH Superalloy Technologies' product catalog lists named nickel-base offerings including xx.xx XP powder and IN xx.xx cast alloy with aerospace application labels. Catalog publication does not establish completed commercial deliveries.

242. Introducing Cast Ingot: Expanding SeAH's Superalloy Capabilities

· Company verification: The August xx.xx 2026 company announcement introduces nickel- and cobalt-based cast-ingot offerings for aerospace and other markets while stating that its Temple facility is moving closer to production. It does not establish completed commissioning or recurring material sales. ([seahsuperalloys.com](https://www.seahsuperalloys.com/news/introducing-cast-ingot-expanding-seahs-superalloy-capabilities))

243. Overseas Affiliates | SeAH Group

· Company verification: SeAH Group identifies SeAH Superalloy Technologies as a U.S. manufacturing subsidiary established in 2024, with a Texas specialty-alloy business intended to serve North America. The group page describes commercial commencement in 2026 as scheduled rather than independently demonstrated.

22. Key Experts

[redacted] The roster brings together alloy-industry leadership, aerospace materials engineering, university research, and public-institution expertise, including roles at ATI Inc., Pratt & Whitney, Rolls-Royce, the National Institute for Materials Science, and the Central University of Technology, Free State. The represented affiliations in the United States, United Kingdom, Japan, South Africa, and other listed countries provide professional context relevant to nickel-based superalloy supply, aerospace buyer requirements, and the commercial interpretation of the accepted material categories.

Table 570. Global Nickel-Based Superalloys for Aerospace Market, Key Experts

Name	Professional Role	Organization	Country
Aijun Huang	Professor of Additive Manufacturing	Monash University	Australia
Alessandro Mottura	Professor of Physical Metallurgy	University of Birmingham	United Kingdom
Alexandre Bellegard Farina	Metallurgist, Research and Development	Villares Metals	Brazil
Alfredo Juan Tolley	Materials Researcher, Centro Atómico Bariloche	Comisión Nacional de Energía Atómica	Argentina
Allison M. Beese	Professor, Materials Science and Engineering	The Pennsylvania State University	United States
Amit Shyam	Group Leader, Alloy Behavior and Design	Oak Ridge National Laboratory	United States
Ana Maria de Sousa Malafaia	Professor and Materials Researcher	Universidade Federal de São João del-Rei	Brazil
Andrei Petrilin	Technical Manager	ISCAR	Israel
Antônio Augusto Couto	Professor, Materials Engineering and Nanotechnology	Universidade Presbiteriana Mackenzie	Brazil
Bekir Sami Yilbas	Distinguished University Professor of Mechanical Engineering	King Fahd University of Petroleum and Minerals	Saudi Arabia
Bruce A. Pint	Group Leader, Corrosion Science and Technology	Oak Ridge National Laboratory	United States
Bruno Durand	Chief Executive Officer	Aubert & Duval	France
Byeong-Joo Lee	Professor, Computational Metallurgy	Pohang University of Science and Technology	South Korea
Carelyn E. Campbell	Research Metallurgist	National Institute of Standards and Technology	United States
Carlos Alberto Alves Cairo	Aerospace Materials Researcher	Instituto de Aeronáutica e Espaço	Brazil

Table 570 - continued

Name	Professional Role	Organization	Country
Carlos Angelo Nunes	Professor of Materials Engineering	Universidade de São Paulo	Brazil
Cathie Rae	Professor of Superalloys, Retired	University of Cambridge	United Kingdom
Chee Kai Chua	Professor, Engineering Product Development	Singapore University of Technology and Design	Singapore
Christof Sommitsch	Professor of Materials Science	Graz University of Technology	Austria
Christoph Leyens	Professor of Materials Engineering	Technische Universität Dresden	Germany
Danieli Aparecida Pereira Reis	Professor of Materials Engineering	Universidade Federal de São Paulo	Brazil
David C. Dunand	Professor, Materials Science and Engineering	Northwestern University	United States
David Dye	Professor of Metallurgy	Imperial College London	United Kingdom
David L. Furrer	Senior Fellow, Materials and Processes Engineering	Pratt & Whitney	United States
Dinesh Kumar Likhi	Former Chairman and Managing Director	Mishra Dhatu Nigam Limited	India
Dipankar Banerjee	Honorary Professor, Materials Engineering; Former Director, DMRL	Indian Institute of Science	India
Dongdong Gu	Professor, Metal Additive Manufacturing	Nanjing University of Aeronautics and Astronautics	China
Erhan Budak	Professor of Manufacturing Engineering	Sabancı University	Turkey
Eric A. Lass	Associate Professor, Materials Science and Engineering	University of Tennessee, Knoxville	United States
Eric S. Huron	Materials Engineering Leader, GE Aviation	GE Aerospace	United States
Francisco Piorino Neto	Materials Researcher	Instituto de Aeronáutica e Espaço	Brazil
Franck Tancret	Professor of Materials Science	Nantes Université	France
Gerrie Booysen	Director, Centre for Rapid Prototyping and Manufacturing	Central University of Technology, Free State	South Africa
Gunther Eggeler	Professor Emeritus of Materials Science	Ruhr University Bochum	Germany
Hardus Greyling	Commercialisation Manager, National Laser Centre	Council for Scientific and Industrial Research	South Africa
Hasan Mandal	Rector; Former President of TÜBİTAK	Istanbul Technical University	Turkey

Table 570 - continued

Name	Professional Role	Organization	Country
Hiroshi Harada	Fellow Emeritus	National Institute for Materials Science	Japan
Howard Stone	Professor of Metallurgy	University of Cambridge	United Kingdom
Hugo Ricardo Zschommler Sandim	Professor of Physical Metallurgy	Universidade de São Paulo	Brazil
Hyun-Uk Hong	Professor, Materials Science and Engineering	Changwon National University	South Korea
Iain Todd	Professor of Metallurgy	University of Sheffield	United Kingdom
Igor Yadroitsev	Professor of Additive Manufacturing	Central University of Technology, Free State	South Africa
İsmail Lazoğlu	Professor of Mechanical Engineering; Director, Manufacturing and Automation Research Center	Koç University	Turkey
Jack Bedder	Co-Founder and Director	Project Blue	United Kingdom
Jean-Benoît Le Graverend	Associate Professor, Aerospace Engineering	Texas A&M University	United States
Jean-Charles Stinville	Assistant Professor, Materials Science and Engineering	University of Illinois Urbana-Champaign	United States
Jianxin Dong	Professor, School of Materials Science and Engineering	University of Science and Technology Beijing	China
Joachim Rösler	Professor of Materials Science	Technische Universität Braunschweig	Germany
Johan Moverare	Professor of Engineering Materials	Linköping University	Sweden
Johan Westraadt	Materials Researcher, Centre for High Resolution Transmission Electron Microscopy	Nelson Mandela University	South Africa
John C. Lippold	Professor Emeritus, Welding Engineering	The Ohio State University	United States
John J. Schirra	Senior Fellow, Materials Engineering	Pratt & Whitney	United States
John N. DuPont	R. D. Stout Distinguished Professor, Materials Science and Engineering	Lehigh University	United States
John Telesman	Materials Research Engineer	NASA Glenn Research Center	United States
Jonathan Beddoes	Professor, Mechanical Engineering; Former Dean of Engineering	University of Manitoba	Canada
Jonathan Cormier	Professor of Materials Science	ISAE-ENSMA	France

Table 570 - continued

Name	Professional Role	Organization	Country
João Quinta da Fonseca	Professor of Metallurgy	University of Manchester	United Kingdom
Jutta Klöwer	Materials Scientist, High-Temperature Nickel Alloys	VDM Metals	Germany
Kimberly A. Fields	President and Chief Executive Officer	ATI Inc.	United States
Koji Kakehi	Professor	Tokyo Metropolitan University	Japan
Krishna S. Kumar	Professor of Engineering	Brown University	United States
Kyoko Kawagishi	Group Leader, High-Temperature Materials	National Institute for Materials Science	Japan
Langhong Lou	Professor, Superalloys Research	Institute of Metal Research, Chinese Academy of Sciences	China
Lee M. Pike	Director, Research and Technology	Haynes International	United States
Lei Xue	Chairman and General Manager	Xi'an Bright Laser Technologies	China
Lesley Cornish	Professor of Physical Metallurgy	University of the Witwatersrand	South Africa
Liang Jiang	Professor	Southern University of Science and Technology	China
Ma Qian	Professor of Advanced Manufacturing and Materials	RMIT University	Australia
Mahmut Faruk Akşit	General Manager and Chief Executive Officer	TUSAŞ Engine Industries (TEI)	Turkey
Mark Easton	Professor, School of Engineering	RMIT University	Australia
Mark Hardy	Engineering Fellow, High-Temperature Materials	Rolls-Royce	United Kingdom
Mark P. Donegan	Chairman and Chief Executive Officer	Precision Castparts Corp.	United States
Mark Whittaker	Professor of Materials	Swansea University	United Kingdom
Markus Moll	Managing Director and Senior Market Analyst	SMR - Steel & Metals Market Research	Austria
Mathias Göken	Professor of Materials Science and Engineering	Friedrich-Alexander-Universität Erlangen-Nürnberg	Germany
Maurizio Vedani	Professor of Metallurgy	Politecnico di Milano	Italy
Michael A. Murtagh	Senior Vice President and Chief Technology Officer	Carpenter Technology Corporation	United States
Michael D. Sangid	Professor, Aeronautics and Astronautics	Purdue University	United States
Michael D. Uchic	Materials Research Engineer	Air Force Research Laboratory	United States

Table 570 - continued

Name	Professional Role	Organization	Country
Michael Holmes	Chief Executive Officer and Co-Founder	Alloyed	United Kingdom
Michael J. Mills	Professor and Chair, Materials Science and Engineering	The Ohio State University	United States
Michael L. Shor	President and Chief Executive Officer	Haynes International	United States
Michel Rappaz	Professor Emeritus of Materials Science	École Polytechnique Fédérale de Lausanne	Switzerland
Miguel Justino Ribeiro Barboza	Professor of Materials Engineering	Universidade de São Paulo	Brazil
Mike Quinn	Chief Executive Officer	Doncasters	United Kingdom
Milan Brandt	Professor of Advanced Manufacturing; Founding Director, Centre for Additive Manufacturing	RMIT University	Australia
Moataz Attallah	Professor of Advanced Materials Processing	University of Birmingham	United Kingdom
Mohammad Jahazi	Professor, Mechanical Engineering	École de technologie supérieure	Canada
Nathalie Bozzolo	Professor of Physical Metallurgy	Mines Paris - PSL	France
Nigel D'Souza	Materials Technologist, Single-Crystal Castings	Rolls-Royce	United Kingdom
Osman Dur	General Manager	TRMotor Power Systems	Turkey
Osman Okyay	Vice Chairman and Head of Technical Division	Kale Group	Turkey
Patrick Villechaise	Research Director, Institut Pprime	Centre National de la Recherche Scientifique	France
Paul A. Shade	Materials Research Engineer	Air Force Research Laboratory	United States
Paul Bagot	Associate Professor of Materials	University of Oxford	United Kingdom
Paul Withey	Professor of Casting	University of Birmingham	United Kingdom
Philip Withers	Regius Professor of Materials	University of Manchester	United Kingdom
Philippe Bocher	Professor, Mechanical Engineering	École de technologie supérieure	Canada
Qiang Feng	Professor, School of Materials Science and Engineering	University of Science and Technology Beijing	China
Rashid K. Abu Al-Rub	Professor of Mechanical Engineering; Director, Advanced Digital and Additive Manufacturing Center	Khalifa University	United Arab Emirates

Table 570 - continued

Name	Professional Role	Organization	Country
Robert Knutsen	Professor of Mechanical Engineering, Centre for Materials Engineering	University of Cape Town	South Africa
Robert Löcker	Management Board Member and Head of the High Performance Metals Division	voestalpine	Austria
Robert S. Wetherbee	Executive Chairman and Former Chief Executive Officer	ATI Inc.	United States
Roger Reed	Professor of Materials	University of Oxford	United Kingdom
Roland Logé	Professor of Thermomechanical Metallurgy	École Polytechnique Fédérale de Lausanne	Switzerland
Ru Yang	Professor; Former Institute Director	Institute of Metal Research, Chinese Academy of Sciences	China
Ryan R. Dehoff	Director, Manufacturing Demonstration Facility	Oak Ridge National Laboratory	United States
Samir V. Kamat	Secretary, Department of Defence R&D; Chairman, DRDO	Defence Research and Development Organisation	India
Sammy Tin	Department Head and Professor, Materials Science and Engineering	University of Arizona	United States
Sanjay Kumar Jha	Former Chairman and Managing Director	Mishra Dhatu Nigam Limited	India
Satyam Suwas	Professor, Department of Materials Engineering	Indian Institute of Science	India
Seong-Moon Seo	Principal Researcher, High-Temperature Materials	Korea Institute of Materials Science	South Korea
Sisa Pityana	Principal Researcher, Laser Materials Processing	Council for Scientific and Industrial Research	South Africa
Stephen Yue	Professor and Director, McGill Aerospace Materials and Alloy Development Centre	McGill University	Canada
Suresh Babu	UT-ORNL Governor's Chair for Advanced Manufacturing	University of Tennessee, Knoxville	United States
Timothy M. Smith	Materials Research Engineer	NASA Glenn Research Center	United States
Timothy P. Gabb	Materials Research Engineer	NASA Glenn Research Center	United States
Tony R. Thene	President and Chief Executive Officer	Carpenter Technology Corporation	United States
Tresa M. Pollock	Alcoa Distinguished Professor of Materials	University of California, Santa Barbara	United States

Table 570 - continued

Name	Professional Role	Organization	Country
Upadrasta Ramamurty	President's Chair Professor, Mechanical and Aerospace Engineering	Nanyang Technological University	Singapore
Uwe Glatzel	Professor of Metallic Materials	University of Bayreuth	Germany
Victoria M. Miller	Associate Professor, Materials Science and Engineering	University of Florida	United States
Wei Zhou	Associate Professor, School of Mechanical and Aerospace Engineering	Nanyang Technological University	Singapore
Weidong Huang	Founder and Chief Scientist	Xi'an Bright Laser Technologies	China
Willie du Preez	Research Professor, Centre for Rapid Prototyping and Manufacturing	Central University of Technology, Free State	South Africa
Xiao Huang	Professor, Mechanical and Aerospace Engineering	Carleton University	Canada
Xiaofeng Sun	Professor, Superalloys Research	Institute of Metal Research, Chinese Academy of Sciences	China
Xin Lin	Professor, State Key Laboratory of Solidification Processing	Northwestern Polytechnical University	China
Xinhua Wu	Professor of Materials Engineering; Founding Director, Monash Centre for Additive Manufacturing	Monash University	Australia
Yuichiro Koizumi	Professor, Graduate School of Engineering	Osaka University	Japan

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Contributors

Shikha Sachan

Chief Executive Officer

A transformational leader with a strong focus on integrating new technology frameworks into market research. She focuses on reshaping business models in line with evolving technologies and geopolitical shifts, while actively engaging with decision-makers and experts to deliver trustworthy insights, strategic clarity, and lasting business value.

Shraddha Bhirud

Research Manager

With extensive experience in market intelligence, leads complex client engagements by overseeing multiple research projects from initiation to delivery. Strengthens research operations timely through standardized methods, process optimization, and cross-functional collaboration while supporting sales initiatives. Her commitment to quality, and client success ensures the delivery of actionable insights.

Vivek Paymode

Research Lead

Oversees end-to-end research engagements by mentoring analysts and delivering reliable market intelligence. Specializes in industry analysis, company profiling, trend evaluation, opportunity assessment, and quality assurance. Collaborates closely with clients and internal teams to ensure actionable insights that support informed strategic business decisions.

Shailesh Sachan

Research Lead

Leads market intelligence projects by guiding research analysts and ensuring accurate, insight-driven deliverables. Specializes in competitive benchmarking, market assessment, research planning, data validation, and project execution. Delivers high-quality outcomes through effective client coordination, structured workflows, and consistent adherence to project timelines and quality standards.

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