

# Technology Metals & Rare Earth Elements

Global Sourcing & Trading Excellence

**CATALOGUE 2026**

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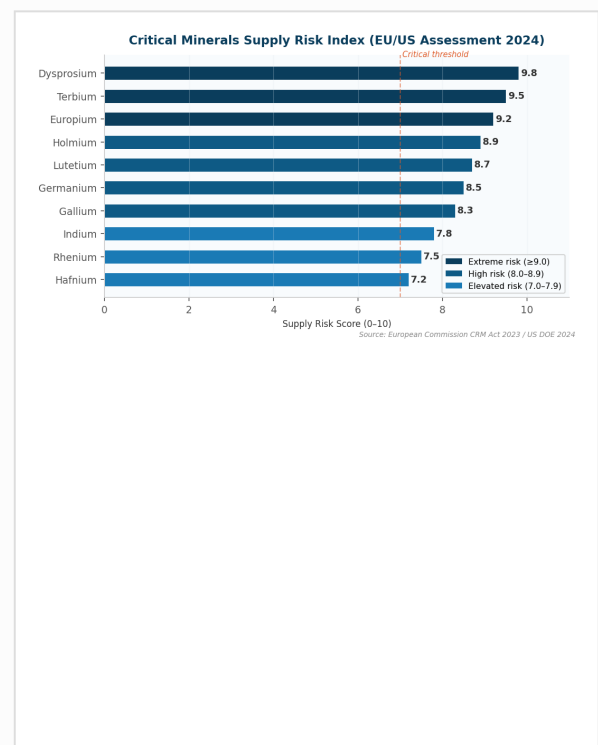
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## Chapter 1 — About Us



Founded in Geneva, Switzerland, Alixyz S.A. is a premier global trading company specializing in Technology Metals and Rare Earth Elements. With over 20 years of industry expertise, we serve as a trusted bridge between producers and industrial consumers across more than 130 countries worldwide. Our commitment to quality, reliability, and transparency has established us as one of the most respected names in the specialty metals trading sector.

**20+**

YEARS OF EXPERIENCE

**130+**

COUNTRIES SERVED

**26**

PRODUCTS AVAILABLE

**AAA**

CREDIT RATING

### Our Mission

To provide reliable, high-quality access to critical technology metals and rare earth elements that power the industries of tomorrow. We believe in building long-term partnerships based on trust, transparency, and technical excellence.

Our dedicated team of specialists monitors global market trends, supply chain dynamics, and geopolitical factors to ensure our clients always have access to the materials they need at competitive prices.

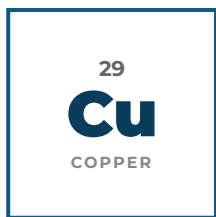
### Our Services

- Direct sourcing from certified producers
- Quality certification and assay verification
- Logistics and customs management
- Hedging and price risk management
- Technical consulting and market intelligence
- Long-term supply agreements

### Quality Standards

All products traded by Alixyz S.A. undergo rigorous quality verification. We work exclusively with ISO-certified suppliers and provide full documentation including certificates of analysis, origin certificates, and third-party assay reports.

Our Geneva headquarters maintains the highest standards of Swiss financial and commercial integrity.



# Copper

Copper is one of humanity's oldest and most versatile metals. As the best non-precious electrical conductor, it is indispensable in modern electronics, power transmission, and telecommunications infrastructure.

## PHYSICAL & CHEMICAL PROPERTIES

Atomic Weight	63.546 g/mol
Melting Point	1,085°C (1,984°F)
Density	8.96 g/cm <sup>3</sup>
Electrical Conductivity	59.6 × 10 <sup>6</sup> S/m
Thermal Conductivity	401 W/(m·K)
Crystal Structure	Face-centered cubic
Purity Available	99.9% – 99.999%

## AVAILABLE PRODUCTS

- Copper Powder (various mesh sizes)
- Copper Ingot (99.9% – 99.99%)
- Copper Cathode (Grade A)
- Copper Wire Rod
- Copper Granules

## KEY APPLICATIONS

Electronics & PCBs

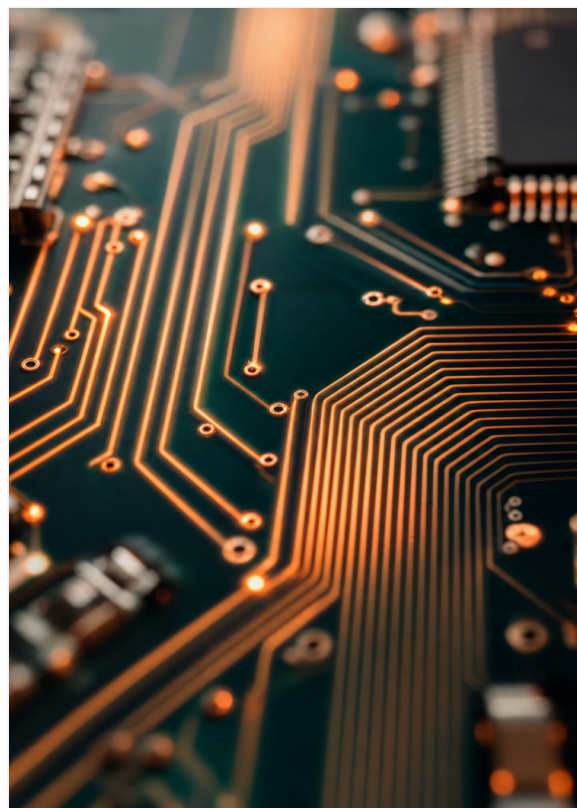
Power Cables

Electric Motors

Heat Exchangers

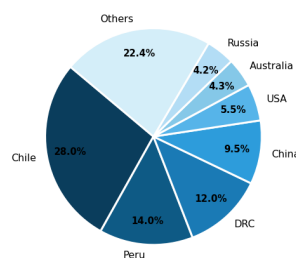
Plumbing

Renewable Energy



Copper traces on printed circuit boards — the foundation of modern electronics

Global Copper Mine Production by Country (2024)  
Total: ~22 million tonnes



Source: ICSG / USGS 2024

Global Copper Mine Production by Country (2024)



# Nickel

Nickel is a critical industrial metal prized for its corrosion resistance, high-temperature strength, and magnetic properties. It is essential in stainless steel production, superalloys for aerospace, and lithium-ion battery cathodes.

## PHYSICAL & CHEMICAL PROPERTIES

Atomic Weight	58.693 g/mol
Melting Point	1,455°C (2,651°F)
Density	8.908 g/cm <sup>3</sup>
Electrical Conductivity	14.3 × 10 <sup>6</sup> S/m
Thermal Conductivity	90.9 W/(m·K)
Crystal Structure	Face-centered cubic
Purity Available	99.5% – 99.99%

## AVAILABLE PRODUCTS

- Nickel Wire (various gauges)
- Nickel Pellets (99.9%)
- Nickel Powder (fine grade)
- Nickel Rounds
- Nickel Cathode

## KEY APPLICATIONS

Jet Engine Turbines

Stainless Steel

EV Batteries

Chemical Processing

Electroplating

Magnets



Nickel superalloy turbine blades — enabling high-temperature aerospace performance

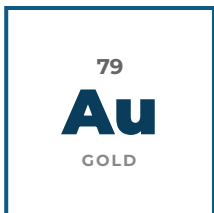
## Market Insights & Strategic Value

Global demand for Nickel is projected to grow significantly over the next decade, driven by its critical role in advanced technologies. Supply chain resilience and strategic sourcing remain key priorities for industrial consumers worldwide. As technological applications expand, securing reliable, high-purity supply lines becomes a competitive advantage.

Supply Risk Index **Moderate to High**

Global Recycling Rate **< 15% (End-of-life)**

Primary Growth Driver **High-tech & Green Energy**



# Gold

Gold is the ultimate conductor for critical electronic connections. Its unmatched resistance to corrosion and oxidation makes it irreplaceable in high-reliability electronics, semiconductor bonding, and advanced medical devices.

## PHYSICAL & CHEMICAL PROPERTIES

Atomic Weight	196.967 g/mol
Melting Point	1,064°C (1,947°F)
Density	19.30 g/cm <sup>3</sup>
Electrical Conductivity	45.2 × 10 <sup>6</sup> S/m
Thermal Conductivity	318 W/(m·K)
Crystal Structure	Face-centered cubic
Purity Available	99.99% – 99.999%

## AVAILABLE PRODUCTS

- Gold Wire (various gauges, 99.99%)
- Gold Bonding Wire (ultra-fine)
- Gold Pellets (99.999%)
- Gold Sputtering Targets
- Gold Powder

## KEY APPLICATIONS

Semiconductor Bonding

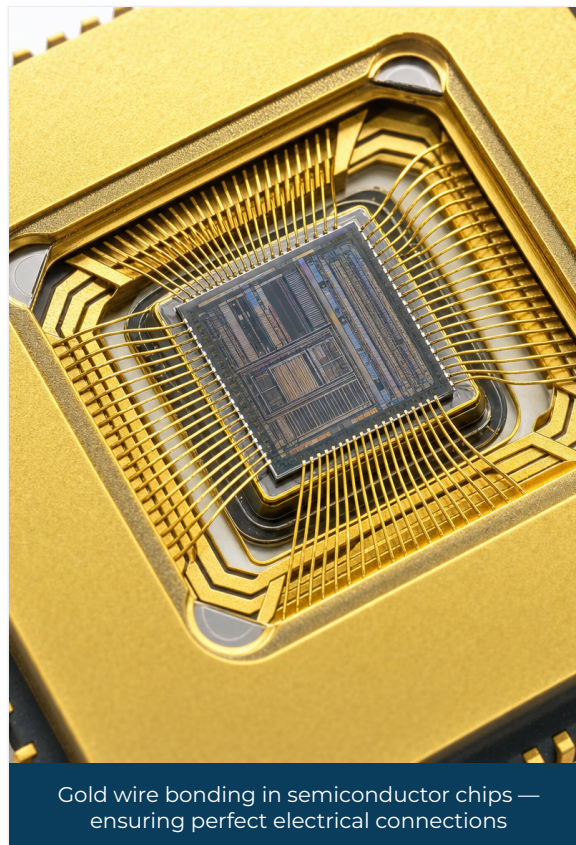
Aerospace Electronics

Medical Devices

Connectors

Satellite Systems

Nanotechnology



Gold wire bonding in semiconductor chips — ensuring perfect electrical connections

## Market Insights & Strategic Value

Global demand for Gold is projected to grow significantly over the next decade, driven by its critical role in advanced technologies. Supply chain resilience and strategic sourcing remain key priorities for industrial consumers worldwide. As technological applications expand, securing reliable, high-purity supply lines becomes a competitive advantage.

Supply Risk Index **Moderate to High**

Global Recycling Rate **< 15% (End-of-life)**

Primary Growth Driver **High-tech & Green Energy**



# Germanium

Germanium is a critical semiconductor and optical material essential for fiber optic communications, infrared optics, solar cells, and advanced electronics. Global supply is highly concentrated, making reliable sourcing critical.

## PHYSICAL & CHEMICAL PROPERTIES

Atomic Weight	72.630 g/mol
Melting Point	938°C (1,720°F)
Density	5.323 g/cm <sup>3</sup>
Band Gap	0.67 eV at 300K
Refractive Index	4.0 (IR range)
Crystal Structure	Diamond cubic
Purity Available	99.99% – 99.9999%

## AVAILABLE PRODUCTS

- Germanium Ingot (5N – 6N purity)
- Germanium Powder (99.99%)
- Germanium Dioxide (GeO<sub>2</sub>)
- Germanium Sputtering Targets
- Germanium Wafers

## KEY APPLICATIONS

Fiber Optic Cables

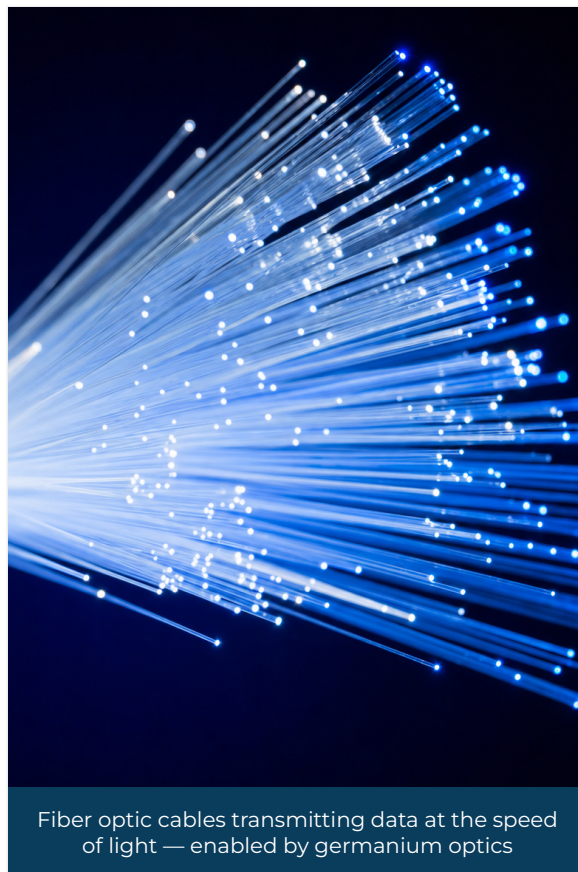
Infrared Optics

Solar Cells

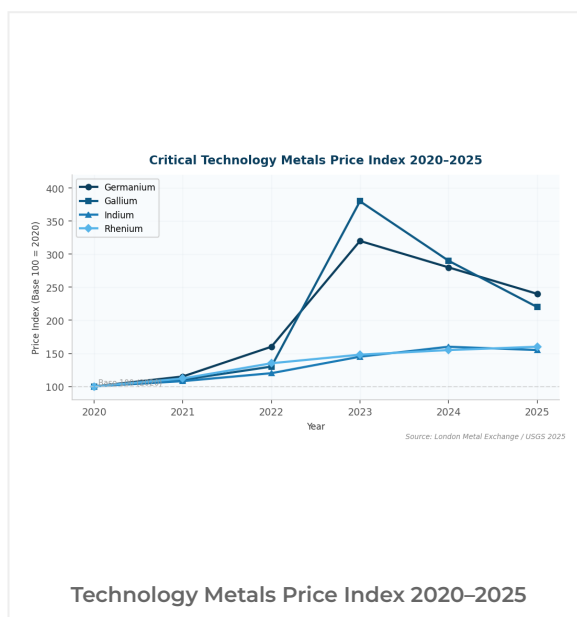
Night Vision

Semiconductors

Satellite Solar Panels



Fiber optic cables transmitting data at the speed of light — enabled by germanium optics





# Indium

Indium is a soft, silvery metal critical to transparent conductive coatings. As a primary component of Indium Tin Oxide (ITO), it is essential for touchscreens, flat panel displays, and thin-film solar cells.

## PHYSICAL & CHEMICAL PROPERTIES

Atomic Weight	114.818 g/mol
Melting Point	156.6°C (313.9°F)
Density	7.31 g/cm <sup>3</sup>
Electrical Conductivity	11.4 × 10 <sup>6</sup> S/m
Thermal Conductivity	81.8 W/(m·K)
Crystal Structure	Face-centered tetragonal
Purity Available	99.99% – 99.9999%

## AVAILABLE PRODUCTS

- Indium Ingot (4N – 6N purity)
- Indium Powder (99.99%)
- Indium Wire
- ITO Sputtering Targets
- Indium Foil

## KEY APPLICATIONS

LCD/OLED Displays

Touchscreens

Thin-Film Solar

Semiconductors

Low-Temp Solders

Bearings



OLED display manufacturing — indium tin oxide enables every touchscreen interaction

## Market Insights & Strategic Value

Global demand for Indium is projected to grow significantly over the next decade, driven by its critical role in advanced technologies. Supply chain resilience and strategic sourcing remain key priorities for industrial consumers worldwide. As technological applications expand, securing reliable, high-purity supply lines becomes a competitive advantage.

Supply Risk Index **Moderate to High**

Global Recycling Rate **< 15% (End-of-life)**

Primary Growth Driver **High-tech & Green Energy**



# Rhenium

Rhenium has the second-highest melting point of all elements, making it irreplaceable in high-temperature superalloys for jet engine turbine blades. It is one of the rarest and most valuable metals in commercial use.

## PHYSICAL & CHEMICAL PROPERTIES

Atomic Weight	186.207 g/mol
Melting Point	3,186°C (5,767°F)
Density	21.02 g/cm <sup>3</sup>
Electrical Conductivity	5.42 × 10 <sup>6</sup> S/m
Thermal Conductivity	48.0 W/(m·K)
Crystal Structure	Hexagonal close-packed
Purity Available	99.9% – 99.999%

## AVAILABLE PRODUCTS

- Rhenium Pellets (99.99%)
- Rhenium Powder (various grades)
- Rhenium Wire
- Ammonium Perrhenate
- Rhenium Sputtering Targets

## KEY APPLICATIONS

Jet Engine Turbines

Rocket Engines

Petroleum Catalysts

Thermocouples

Electrical Contacts

X-ray Equipment



Jet engine turbine cross-section — rhenium superalloys withstand extreme temperatures

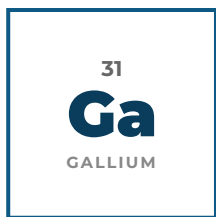
## Market Insights & Strategic Value

Global demand for Rhenium is projected to grow significantly over the next decade, driven by its critical role in advanced technologies. Supply chain resilience and strategic sourcing remain key priorities for industrial consumers worldwide. As technological applications expand, securing reliable, high-purity supply lines becomes a competitive advantage.

Supply Risk Index **Moderate to High**

Global Recycling Rate **< 15% (End-of-life)**

Primary Growth Driver **High-tech & Green Energy**



# Gallium

Gallium is a critical semiconductor material used in compound semiconductors (GaAs, GaN) that power LEDs, laser diodes, solar cells, and high-frequency electronics. It melts at near room temperature.

## PHYSICAL & CHEMICAL PROPERTIES

Atomic Weight	69.723 g/mol
Melting Point	29.76°C (85.6°F)
Density	5.91 g/cm <sup>3</sup> (liquid)
Electrical Conductivity	6.74 × 10 <sup>6</sup> S/m
Thermal Conductivity	40.6 W/(m·K)
Crystal Structure	Orthorhombic
Purity Available	99.99% – 99.9999%

## AVAILABLE PRODUCTS

- Gallium Metal (4N – 6N purity)
- Gallium Arsenide (GaAs) Wafers
- Gallium Nitride (GaN) Substrates
- Gallium Oxide Powder
- Gallium Sputtering Targets

## KEY APPLICATIONS

LED Lighting

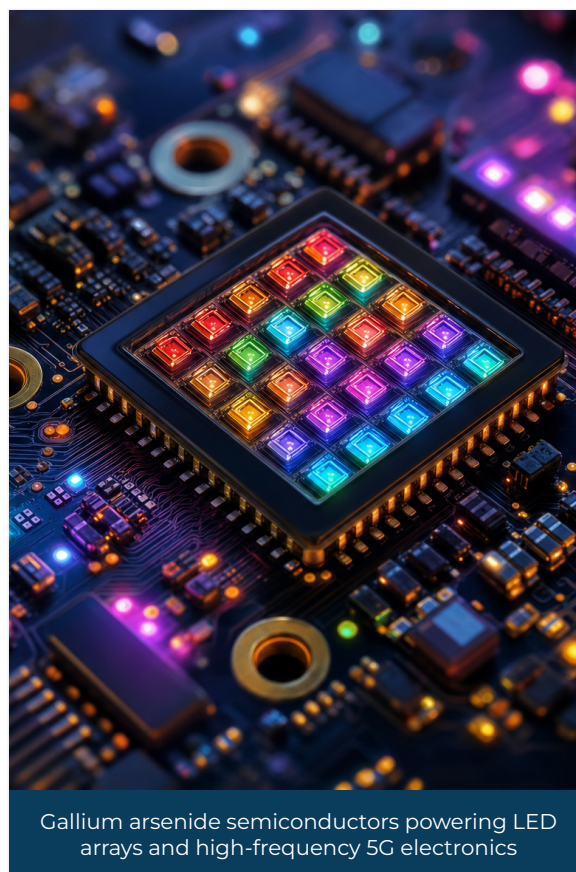
Laser Diodes

5G Semiconductors

Solar Cells

Radar Systems

Power Electronics



Gallium arsenide semiconductors powering LED arrays and high-frequency 5G electronics

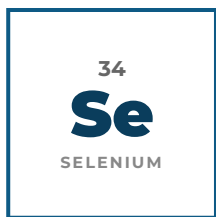
## Market Insights & Strategic Value

Global demand for Gallium is projected to grow significantly over the next decade, driven by its critical role in advanced technologies. Supply chain resilience and strategic sourcing remain key priorities for industrial consumers worldwide. As technological applications expand, securing reliable, high-purity supply lines becomes a competitive advantage.

Supply Risk Index **Moderate to High**

Global Recycling Rate **< 15% (End-of-life)**

Primary Growth Driver **High-tech & Green Energy**



# Selenium

Selenium is a versatile metalloid with unique photoelectric and semiconductor properties. It is essential in thin-film photovoltaic cells (CIGS technology), glass manufacturing, and electronics.

## PHYSICAL & CHEMICAL PROPERTIES

Atomic Weight	78.971 g/mol
Melting Point	221°C (430°F)
Density	4.81 g/cm <sup>3</sup>
Band Gap	1.74 eV (hexagonal)
Electrical Conductivity	Variable (photoconductor)
Crystal Structure	Hexagonal (grey)
Purity Available	99.5% – 99.999%

## AVAILABLE PRODUCTS

- Selenium Powder (99.9% – 99.999%)
- Selenium Granules
- Selenium Pellets
- Selenium Dioxide (SeO<sub>2</sub>)
- Selenium Sputtering Targets

## KEY APPLICATIONS

Thin-Film Solar (CIGS)

Glass Decolorizing

Photocopiers

Electronics

Agriculture

Pigments



CIGS thin-film solar panels — selenium enables next-generation photovoltaic technology

## Market Insights & Strategic Value

Global demand for Selenium is projected to grow significantly over the next decade, driven by its critical role in advanced technologies. Supply chain resilience and strategic sourcing remain key priorities for industrial consumers worldwide. As technological applications expand, securing reliable, high-purity supply lines becomes a competitive advantage.

Supply Risk Index **Moderate to High**

Global Recycling Rate **< 15% (End-of-life)**

Primary Growth Driver **High-tech & Green Energy**



# Titanium

Titanium offers an exceptional strength-to-weight ratio combined with outstanding corrosion resistance. These properties make it the material of choice for aerospace structures, medical implants, and marine applications.

## PHYSICAL & CHEMICAL PROPERTIES

Atomic Weight	47.867 g/mol
Melting Point	1,668°C (3,034°F)
Density	4.506 g/cm <sup>3</sup>
Tensile Strength	434 MPa (Grade 2)
Thermal Conductivity	21.9 W/(m·K)
Crystal Structure	Hexagonal (α) / BCC (β)
Purity Available	99.5% – 99.99%

## AVAILABLE PRODUCTS

- Titanium Sponge (Grade 1–4)
- Titanium Powder (various grades)
- Titanium Ingot
- Titanium Wire
- Titanium Foil

## KEY APPLICATIONS

Aerospace Structures

Medical Implants

Marine Equipment

Sports Equipment

Chemical Processing

Architecture



Titanium medical implants — biocompatible, lightweight, and exceptionally strong

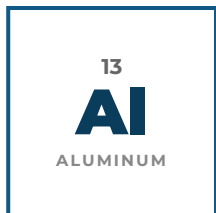
## Market Insights & Strategic Value

Global demand for Titanium is projected to grow significantly over the next decade, driven by its critical role in advanced technologies. Supply chain resilience and strategic sourcing remain key priorities for industrial consumers worldwide. As technological applications expand, securing reliable, high-purity supply lines becomes a competitive advantage.

Supply Risk Index **Moderate to High**

Global Recycling Rate **< 15% (End-of-life)**

Primary Growth Driver **High-tech & Green Energy**



# Aluminum

Aluminum is the most abundant metal in Earth's crust and the second most used metal globally. Its combination of low density, high strength, excellent corrosion resistance, and recyclability makes it essential across transportation, construction, and packaging.

## PHYSICAL & CHEMICAL PROPERTIES

Atomic Weight	26.982 g/mol
Melting Point	660°C (1,220°F)
Density	2.70 g/cm <sup>3</sup>
Electrical Conductivity	37.7 × 10 <sup>6</sup> S/m
Thermal Conductivity	237 W/(m·K)
Crystal Structure	Face-centered cubic
Purity Available	99.5% – 99.999%

## AVAILABLE PRODUCTS

- Aluminum Ingot (99.7% – 99.99%)
- Aluminum Powder (various grades)
- Aluminum Alloy Ingots
- Aluminum Wire
- Aluminum Pellets

## KEY APPLICATIONS

Aerospace Structures

Automotive

Packaging

Construction

Electrical Cables

Consumer Electronics



Aircraft fuselage construction — aluminum alloys enable lightweight aerospace structures

## Market Insights & Strategic Value

Global demand for Aluminum is projected to grow significantly over the next decade, driven by its critical role in advanced technologies. Supply chain resilience and strategic sourcing remain key priorities for industrial consumers worldwide. As technological applications expand, securing reliable, high-purity supply lines becomes a competitive advantage.

Supply Risk Index **Moderate to High**

Global Recycling Rate **< 15% (End-of-life)**

Primary Growth Driver **High-tech & Green Energy**



# Lithium

Lithium is the lightest metal and the cornerstone of the global energy transition. As the key component in lithium-ion batteries, it powers electric vehicles, grid-scale energy storage, and portable electronics. Demand is projected to grow exponentially through 2030.

## PHYSICAL & CHEMICAL PROPERTIES

Atomic Weight	6.941 g/mol
Melting Point	180.5°C (357°F)
Density	0.534 g/cm <sup>3</sup> (lightest metal)
Specific Heat	3,582 J/(kg·K)
Thermal Conductivity	84.8 W/(m·K)
Crystal Structure	Body-centered cubic
Purity Available	99.5% – 99.99%

## AVAILABLE PRODUCTS

- Lithium Carbonate (Li<sub>2</sub>CO<sub>3</sub>, Battery Grade)
- Lithium Hydroxide (LiOH, Battery Grade)
- Lithium Metal (99.9%)
- Lithium Chloride
- Lithium Foil

## KEY APPLICATIONS

EV Batteries

Grid Storage

Consumer Electronics

Aerospace Alloys

Ceramics &amp; Glass

Pharmaceuticals



Electric vehicle battery pack — lithium-ion technology powering the clean energy transition

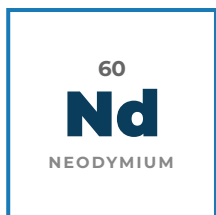


## Chapter Three

# Rare Earth Elements

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Rare Earth Elements (REEs) are a group of 17 metallic elements critical to modern technology. REEs are essential for permanent magnets in wind turbines and electric vehicles, phosphors in displays and lighting, catalysts, and advanced defense systems. China controls approximately 68% of global production, making supply chain security a strategic priority. Alixyz S.A. provides reliable access to 12 key rare earth elements from diversified sources.



# Neodymium

Neodymium is the most critical rare earth element for the clean energy transition. NdFeB permanent magnets — the strongest permanent magnets known — are essential in wind turbine generators and electric vehicle motors. A single offshore wind turbine can require up to 2 tonnes of neodymium.

## PHYSICAL & CHEMICAL PROPERTIES

Atomic Weight	144.242 g/mol
Melting Point	1,024°C (1,875°F)
Density	7.01 g/cm <sup>3</sup>
Magnetic Moment	3.62 $\mu$ B
Crystal Structure	Double hexagonal close-packed
Classification	Light REE (LREE)
Purity Available	99% – 99.99%

## AVAILABLE PRODUCTS

- Neodymium Metal (99% – 99.9%)
- Neodymium Oxide (Nd<sub>2</sub>O<sub>3</sub>)
- NdFeB Magnet Alloy
- Neodymium Chloride
- Neodymium Fluoride

## KEY APPLICATIONS

Wind Turbine Generators

EV & Hybrid Motors

Hard Disk Drives

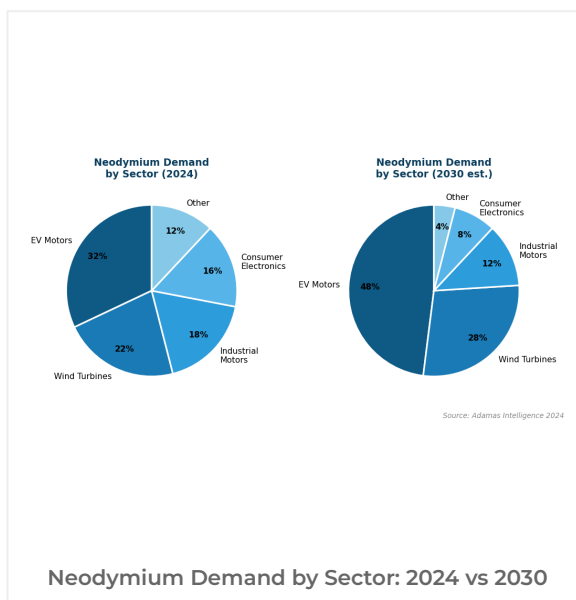
MRI Machines

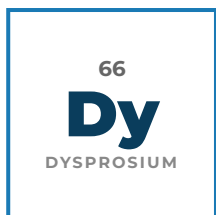
Industrial Motors

Headphones & Speakers



Wind turbine generator with NdFeB permanent magnets — neodymium enables renewable energy at scale





# Dysprosium

Dysprosium is added to NdFeB magnets to maintain their magnetic properties at high operating temperatures. Without dysprosium, NdFeB magnets in electric vehicle motors would demagnetize under normal operating conditions. It is one of the most strategically critical rare earth elements.

## PHYSICAL & CHEMICAL PROPERTIES

Atomic Weight	162.500 g/mol
Melting Point	1,407°C (2,565°F)
Density	8.55 g/cm <sup>3</sup>
Magnetic Moment	10.65 $\mu$ B (highest of all elements)
Crystal Structure	Hexagonal close-packed
Classification	Heavy REE (HREE)
Purity Available	99% – 99.99%

## AVAILABLE PRODUCTS

- Dysprosium Metal (99% – 99.9%)
- Dysprosium Oxide (Dy<sub>2</sub>O<sub>3</sub>)
- Dysprosium Fluoride
- Dysprosium Chloride
- Dysprosium Nitrate

## KEY APPLICATIONS

EV Motor Magnets

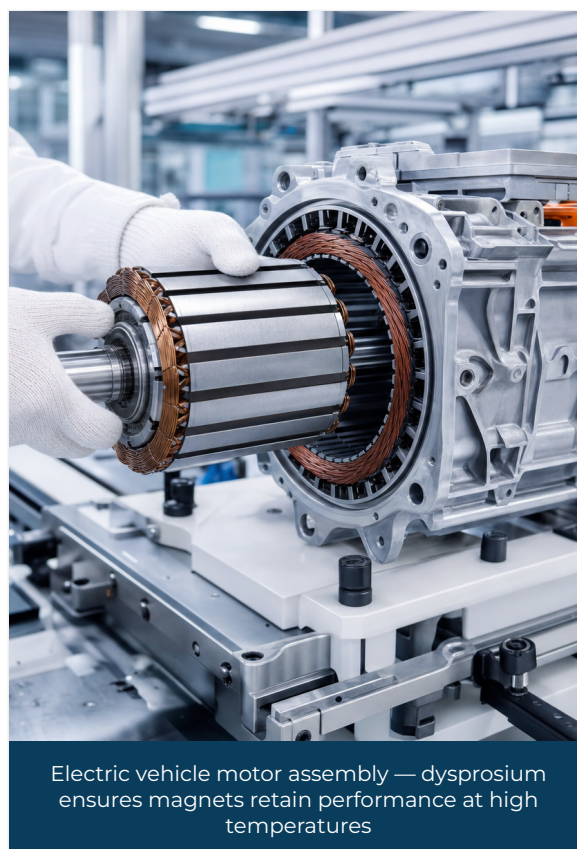
Wind Turbine Magnets

Data Storage

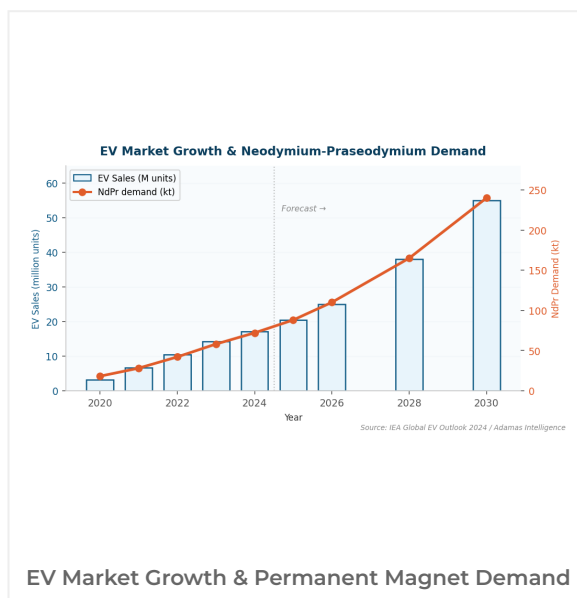
Nuclear Reactor Control

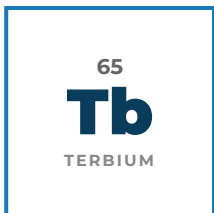
Laser Materials

Magnetostrictive Alloys



Electric vehicle motor assembly — dysprosium ensures magnets retain performance at high temperatures





# Terbium

Terbium is used in green phosphors for energy-efficient lighting and displays, and in magnetostrictive alloys (Terfenol-D) for sonar and actuator applications. Like dysprosium, it enhances NdFeB magnet performance at elevated temperatures, making it critical for EV and wind applications.

## PHYSICAL & CHEMICAL PROPERTIES

Atomic Weight	158.925 g/mol
Melting Point	1,356°C (2,473°F)
Density	8.23 g/cm <sup>3</sup>
Magnetic Moment	9.72 μB
Crystal Structure	Hexagonal close-packed
Classification	Heavy REE (HREE)
Purity Available	99% – 99.99%

## AVAILABLE PRODUCTS

- Terbium Metal (99% – 99.9%)
- Terbium Oxide (Tb<sub>4</sub>O<sub>7</sub>)
- Terbium Fluoride
- Terbium Chloride
- Terbium Nitrate

## KEY APPLICATIONS

Green LED Phosphors

Energy-Efficient Lighting

Sonar Systems

Fuel Cells

NdFeB Magnet Additive

Solid-State Devices



Energy-efficient LED lighting — terbium-based green phosphors deliver vivid, accurate colors

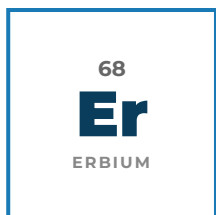
## Market Insights & Strategic Value

Global demand for Terbium is projected to grow significantly over the next decade, driven by its critical role in advanced technologies. Supply chain resilience and strategic sourcing remain key priorities for industrial consumers worldwide. As technological applications expand, securing reliable, high-purity supply lines becomes a competitive advantage.

Supply Risk Index **Moderate to High**

Global Recycling Rate **< 15% (End-of-life)**

Primary Growth Driver **High-tech & Green Energy**



# Erbium

Erbium is essential to global telecommunications infrastructure. Erbium-doped fiber amplifiers (EDFAs) are the primary technology used to amplify optical signals in long-distance fiber optic cables, enabling the internet backbone. It also produces a distinctive pink color in glass and crystals.

## PHYSICAL & CHEMICAL PROPERTIES

Atomic Weight	167.259 g/mol
Melting Point	1,529°C (2,784°F)
Density	9.07 g/cm <sup>3</sup>
Emission Wavelength	1,550 nm (telecom window)
Crystal Structure	Hexagonal close-packed
Classification	Heavy REE (HREE)
Purity Available	99% – 99.999%

## AVAILABLE PRODUCTS

- Erbium Metal (99% – 99.9%)
- Erbium Oxide (Er<sub>2</sub>O<sub>3</sub>)
- Erbium Fluoride
- Erbium Chloride
- Erbium-doped Fiber Preforms

## KEY APPLICATIONS

Fiber Optic Amplifiers

Telecommunications

Medical Lasers (Er:YAG)

Dental Lasers

Nuclear Technology

Colored Glass



Fiber optic data center infrastructure — erbium-doped amplifiers power the global internet

## Market Insights & Strategic Value

Global demand for Erbium is projected to grow significantly over the next decade, driven by its critical role in advanced technologies. Supply chain resilience and strategic sourcing remain key priorities for industrial consumers worldwide. As technological applications expand, securing reliable, high-purity supply lines becomes a competitive advantage.

Supply Risk Index **Moderate to High**

Global Recycling Rate **< 15% (End-of-life)**

Primary Growth Driver **High-tech & Green Energy**



# Europium

Europium produces the most intense red and blue phosphorescence of any rare earth element, making it essential for color television screens, LED phosphors, and fluorescent lighting. It is also used in euro banknote security features as an anti-counterfeiting measure.

## PHYSICAL & CHEMICAL PROPERTIES

Atomic Weight	151.964 g/mol
Melting Point	826°C (1,519°F)
Density	5.24 g/cm <sup>3</sup>
Fluorescence	Red (Eu <sup>3+</sup> ) / Blue (Eu <sup>2+</sup> )
Crystal Structure	Body-centered cubic
Classification	Light REE (LREE)
Purity Available	99% – 99.99%

## AVAILABLE PRODUCTS

- Europium Metal (99% – 99.9%)
- Europium Oxide (Eu<sub>2</sub>O<sub>3</sub>)
- Europium Fluoride
- Europium Chloride
- Europium Nitrate

## KEY APPLICATIONS

TV & Display Phosphors

LED Phosphors

Fluorescent Lamps

Security Inks

Laser Materials

Nuclear Reactors



OLED television display — europium phosphors produce the vivid reds essential for accurate color reproduction

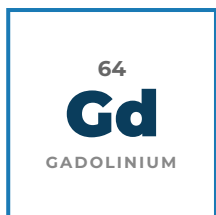
## Market Insights & Strategic Value

Global demand for Europium is projected to grow significantly over the next decade, driven by its critical role in advanced technologies. Supply chain resilience and strategic sourcing remain key priorities for industrial consumers worldwide. As technological applications expand, securing reliable, high-purity supply lines becomes a competitive advantage.

Supply Risk Index **Moderate to High**

Global Recycling Rate **< 15% (End-of-life)**

Primary Growth Driver **High-tech & Green Energy**



# Gadolinium

Gadolinium has unique magnetic and neutron absorption properties that make it invaluable in medical imaging and nuclear technology. As an MRI contrast agent, gadolinium-based compounds dramatically improve the clarity of magnetic resonance images, enabling earlier and more accurate disease diagnosis.

## PHYSICAL & CHEMICAL PROPERTIES

Atomic Weight	157.250 g/mol
Melting Point	1,312°C (2,394°F)
Density	7.90 g/cm <sup>3</sup>
Curie Temperature	20°C (unique magnetic transition)
Neutron Absorption	Highest of all stable elements
Classification	Light REE (LREE)
Purity Available	99% – 99.99%

## AVAILABLE PRODUCTS

- Gadolinium Metal (99% – 99.9%)
- Gadolinium Oxide (Gd<sub>2</sub>O<sub>3</sub>)
- Gadolinium Fluoride
- Gadolinium Chloride
- Gadolinium Nitrate

## KEY APPLICATIONS

MRI Contrast Agents

Nuclear Reactor Shielding

Neutron Radiography

Magnetocaloric Cooling

Phosphors

Microwave Applications



MRI scanner in clinical setting — gadolinium contrast agents enable life-saving medical diagnoses

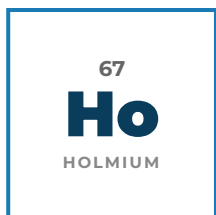
## Market Insights & Strategic Value

Global demand for Gadolinium is projected to grow significantly over the next decade, driven by its critical role in advanced technologies. Supply chain resilience and strategic sourcing remain key priorities for industrial consumers worldwide. As technological applications expand, securing reliable, high-purity supply lines becomes a competitive advantage.

Supply Risk Index **Moderate to High**

Global Recycling Rate **< 15% (End-of-life)**

Primary Growth Driver **High-tech & Green Energy**



# Holmium

Holmium has the highest magnetic moment of any naturally occurring element, making it valuable in powerful magnetic fields. Holmium lasers (Ho:YAG) are widely used in minimally invasive medical procedures, particularly for kidney stone treatment and prostate surgery.

## PHYSICAL & CHEMICAL PROPERTIES

Atomic Weight	164.930 g/mol
Melting Point	1,461°C (2,662°F)
Density	8.80 g/cm <sup>3</sup>
Magnetic Moment	10.6 μB (highest natural element)
Laser Wavelength	2,090 nm (Ho:YAG)
Classification	Heavy REE (HREE)
Purity Available	99% – 99.99%

## AVAILABLE PRODUCTS

- Holmium Metal (99% – 99.9%)
- Holmium Oxide (Ho<sub>2</sub>O<sub>3</sub>)
- Holmium Fluoride
- Holmium Chloride
- Ho:YAG Laser Crystals

## KEY APPLICATIONS

Medical Lasers (Ho:YAG)

Kidney Stone Treatment

Magnetic Flux Concentrators

Nuclear Reactors

Solid-State Lasers

Magnetic Pole Pieces



Holmium laser surgery — minimally invasive procedures enabled by Ho:YAG laser technology

## Market Insights & Strategic Value

Global demand for Holmium is projected to grow significantly over the next decade, driven by its critical role in advanced technologies. Supply chain resilience and strategic sourcing remain key priorities for industrial consumers worldwide. As technological applications expand, securing reliable, high-purity supply lines becomes a competitive advantage.

Supply Risk Index **Moderate to High**

Global Recycling Rate **< 15% (End-of-life)**

Primary Growth Driver **High-tech & Green Energy**



# Lanthanum

Lanthanum is the first element of the rare earth series and one of the most widely used. It is essential in high-refractive-index optical glass for camera and telescope lenses, nickel-metal hydride (NiMH) batteries, petroleum refining catalysts, and as a dopant in various materials.

## PHYSICAL & CHEMICAL PROPERTIES

Atomic Weight	138.905 g/mol
Melting Point	920°C (1,688°F)
Density	6.162 g/cm <sup>3</sup>
Refractive Index	Up to 2.0 (La-doped glass)
Crystal Structure	Double hexagonal close-packed
Classification	Light REE (LREE)
Purity Available	99% – 99.999%

## AVAILABLE PRODUCTS

- Lanthanum Metal (99% – 99.9%)
- Lanthanum Oxide (La<sub>2</sub>O<sub>3</sub>)
- Lanthanum Fluoride
- Lanthanum Chloride
- Lanthanum Carbonate

## KEY APPLICATIONS

Optical Lenses (Camera, Telescope)

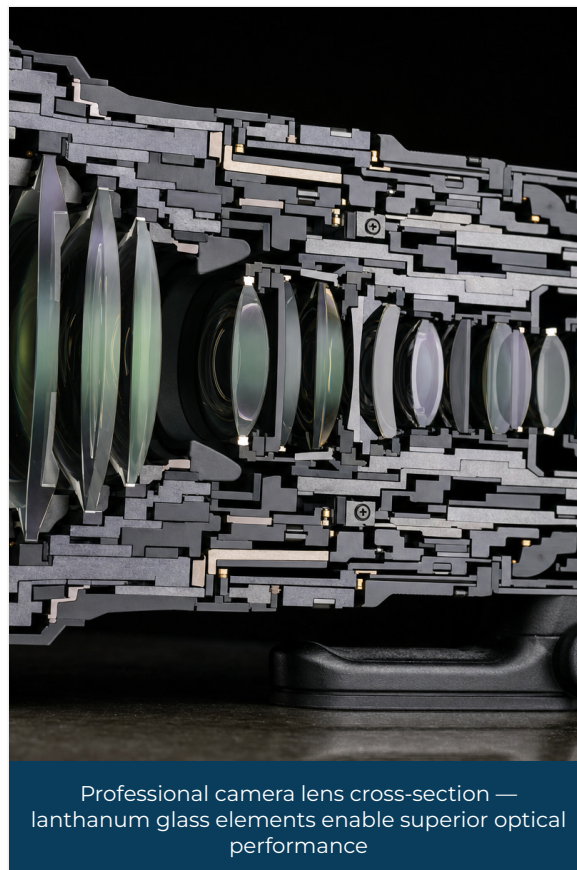
NiMH Batteries (Hybrid Cars)

Petroleum Catalysts

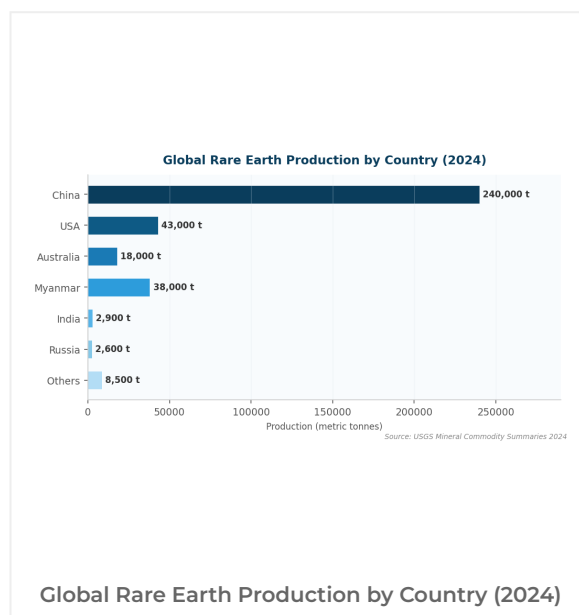
Hydrogen Storage

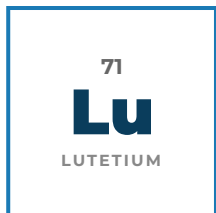
Phosphors

Steel Additive



Professional camera lens cross-section — lanthanum glass elements enable superior optical performance





# Lutetium

Lutetium is the heaviest and densest rare earth element. Its high density and scintillation properties make it essential in PET scan detectors for cancer diagnosis. Lutetium-177 is a radioisotope used in targeted radionuclide therapy for neuroendocrine tumors and prostate cancer.

## PHYSICAL & CHEMICAL PROPERTIES

Atomic Weight	174.967 g/mol
Melting Point	1,652°C (3,006°F)
Density	9.841 g/cm <sup>3</sup> (densest REE)
Scintillation	Excellent (LSO crystals)
Crystal Structure	Hexagonal close-packed
Classification	Heavy REE (HREE)
Purity Available	99% – 99.99%

## AVAILABLE PRODUCTS

- Lutetium Metal (99% – 99.9%)
- Lutetium Oxide (Lu<sub>2</sub>O<sub>3</sub>)
- Lutetium Fluoride
- Lutetium Chloride
- LSO Scintillation Crystals

## KEY APPLICATIONS

PET Scan Detectors

Cancer Radiotherapy (Lu-177)

Neutron Activation Analysis

Catalysts

Specialty Alloys

Scintillation Crystals



PET scanner for nuclear medicine — lutetium scintillation crystals detect cancer with precision

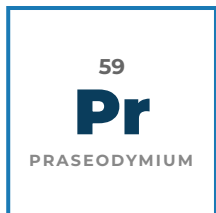
## Market Insights & Strategic Value

Global demand for Lutetium is projected to grow significantly over the next decade, driven by its critical role in advanced technologies. Supply chain resilience and strategic sourcing remain key priorities for industrial consumers worldwide. As technological applications expand, securing reliable, high-purity supply lines becomes a competitive advantage.

Supply Risk Index **Moderate to High**

Global Recycling Rate **< 15% (End-of-life)**

Primary Growth Driver **High-tech & Green Energy**



# Praseodymium

Praseodymium is increasingly important as a substitute for neodymium in permanent magnets (NdPr alloys). It also provides the distinctive yellow-green color in didymium glass used by glassblowers and welders, and is used in high-strength aluminum alloys for aerospace applications.

## PHYSICAL & CHEMICAL PROPERTIES

Atomic Weight	140.908 g/mol
Melting Point	931°C (1,708°F)
Density	6.77 g/cm <sup>3</sup>
Magnetic Moment	3.58 $\mu$ B
Crystal Structure	Double hexagonal close-packed
Classification	Light REE (LREE)
Purity Available	99% – 99.99%

## AVAILABLE PRODUCTS

- Praseodymium Metal (99% – 99.9%)
- Praseodymium Oxide (Pr<sub>6</sub>O<sub>11</sub>)
- Praseodymium Fluoride
- Praseodymium Chloride
- NdPr Alloy

## KEY APPLICATIONS

NdPr Permanent Magnets

Aerospace Alloys

Protective Goggles

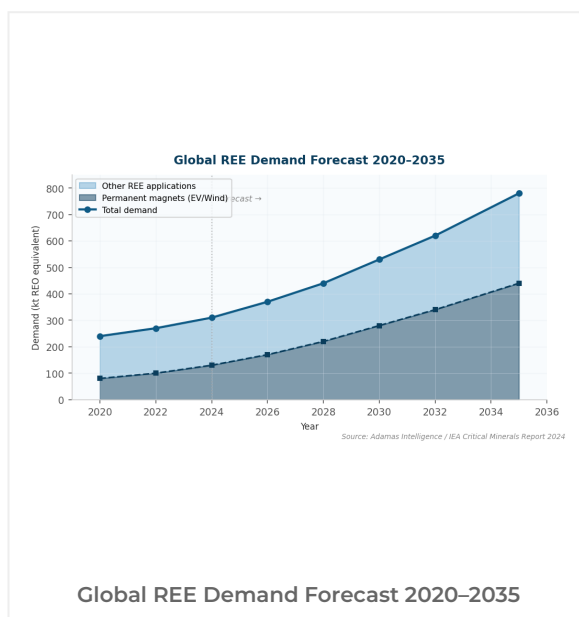
Fiber Optic Amplifiers

Ceramic Pigments

Catalysts



Advanced aircraft cockpit avionics — praseodymium alloys contribute to high-strength aerospace components





# Hafnium

Hafnium is a refractory metal with exceptional neutron absorption properties, making it the material of choice for nuclear reactor control rods. Its high melting point and chemical stability also make it valuable in superalloys for jet engines and in semiconductor gate dielectrics.

## PHYSICAL & CHEMICAL PROPERTIES

Atomic Weight	178.486 g/mol
Melting Point	2,233°C (4,051°F)
Density	13.31 g/cm <sup>3</sup>
Neutron Absorption	Excellent (600 barns)
Thermal Conductivity	23.0 W/(m·K)
Crystal Structure	Hexagonal close-packed
Purity Available	99.5% – 99.99%

## AVAILABLE PRODUCTS

- Hafnium Metal (99.5% – 99.9%)
- Hafnium Sponge
- Hafnium Oxide (HfO<sub>2</sub>)
- Hafnium Chloride
- Hafnium Sputtering Targets

## KEY APPLICATIONS

Nuclear Reactor Control Rods

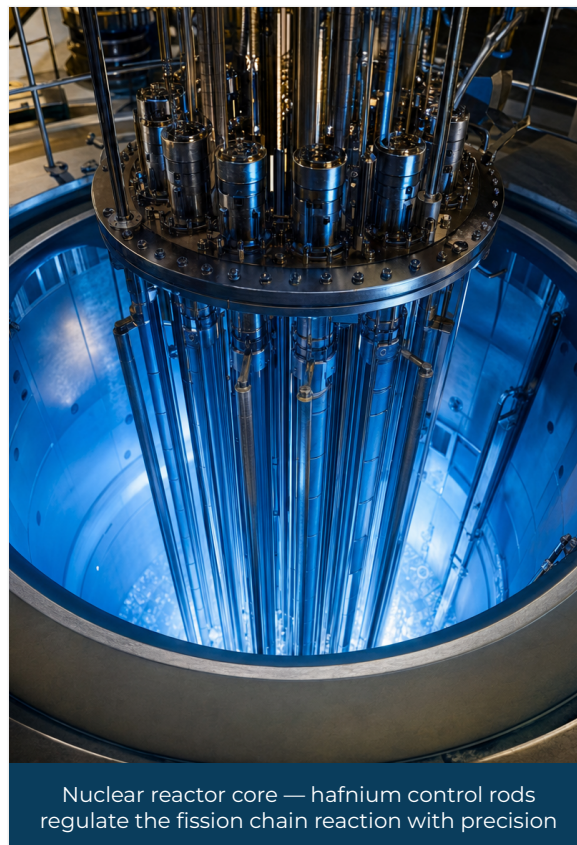
Jet Engine Superalloys

Semiconductor Gate Dielectrics

Plasma Cutting Tips

Rocket Engines

Refractory Coatings



Nuclear reactor core — hafnium control rods regulate the fission chain reaction with precision

## Market Insights & Strategic Value

Global demand for Hafnium is projected to grow significantly over the next decade, driven by its critical role in advanced technologies. Supply chain resilience and strategic sourcing remain key priorities for industrial consumers worldwide. As technological applications expand, securing reliable, high-purity supply lines becomes a competitive advantage.

Supply Risk Index **Moderate to High**

Global Recycling Rate **< 15% (End-of-life)**

Primary Growth Driver **High-tech & Green Energy**



# Samarium

Samarium-cobalt (SmCo) magnets are the second strongest permanent magnets after NdFeB, but offer superior temperature stability and corrosion resistance. They are preferred in high-temperature applications such as aerospace, military systems, and precision motors where reliability is paramount.

## PHYSICAL & CHEMICAL PROPERTIES

Atomic Weight	150.360 g/mol
Melting Point	1,072°C (1,962°F)
Density	7.52 g/cm <sup>3</sup>
Max Operating Temp	350°C (SmCo magnets)
Coercivity	Very high (SmCo)
Classification	Light REE (LREE)
Purity Available	99% – 99.99%

## AVAILABLE PRODUCTS

- Samarium Metal (99% – 99.9%)
- Samarium Oxide (Sm<sub>2</sub>O<sub>3</sub>)
- SmCo Magnet Alloy
- Samarium Fluoride
- Samarium Chloride

## KEY APPLICATIONS

SmCo Permanent Magnets

Military & Defense Systems

Aerospace Motors

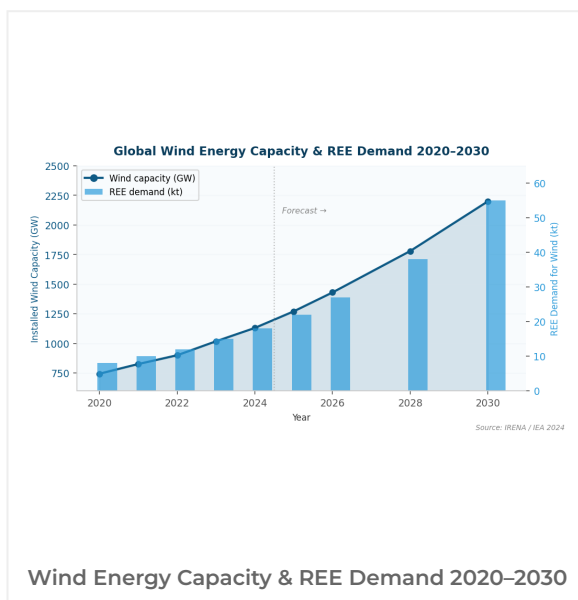
Radar Equipment

Precision Instruments

Nuclear Reactors



Naval radar system — samarium-cobalt magnets deliver reliable performance in extreme military environments



# Contact Us

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### RESPONSE TIME

Within 24 business  
hours

### LANGUAGES

English, French,  
German,

## How to Order

### STEP 1 — INQUIRY

Submit your inquiry via our website or email with product specifications and required quantities.

### STEP 2 — QUOTATION

Receive a tailored quotation within 24 hours.

### STEP 3 — CONTRACT

Review and sign the sales contract with full documentation.

### STEP 4 — DELIVERY

Delivery with full quality documentation including CoA and origin certificates.

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