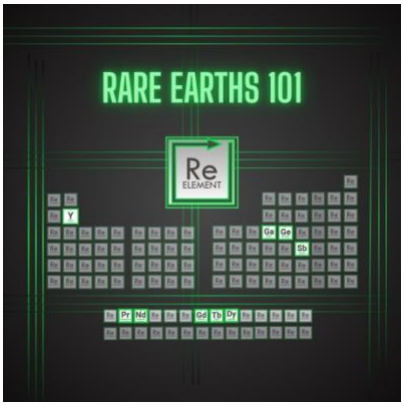
Rare Earths 101

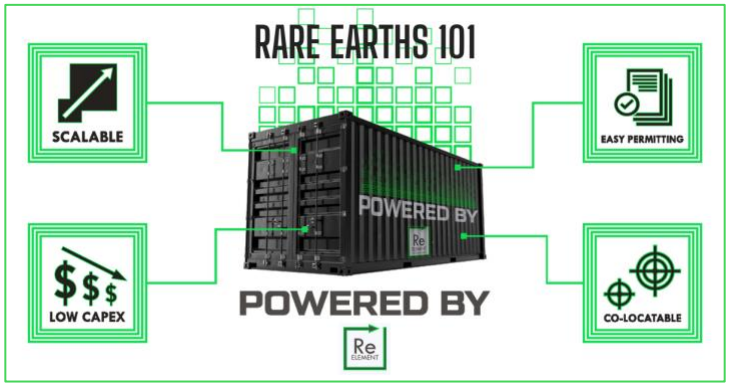


At ReElement, we are often asked five simple questions:

1. What problem are we solving?
2. What are the sources of the materials we process?
3. Which elements are we currently able to process and refine?
4. What are the end markets for those refined materials?
5. What differentiates ReElement?

The **Rare Earths Hub** is an easy-to-follow resource created to answer these questions in a clear and approachable way. Inspired by the simplicity of the early *DOS for Dummies* books, it breaks down complex topics into plain language, making them accessible to a broader audience. Think of it as "Rare Earths 101" — a straightforward introduction to what we do, how it works, and why it matters.

1. What problem are we solving?



A new model for domestic and allied-nation refining capacity.
For rare earths and critical minerals, refining is a major chokepoint. Today, nearly all of the world's refining capacity sits outside the United States. That creates real risk for U.S. manufacturing and defense supply chains, even when the raw materials are available.

ReElement is advancing a new model for domestic and allied-nation refining capacity. Our refining platform can be sited quickly, uses a fraction of the footprint of traditional refineries, and produces ultra-high-purity outputs with a reduced environmental impact.

What that enables:
Rapid deployment to support U.S. and allied supply chains
Ability to co-locate near mining or concentration assets to reduce logistics
Reduced capital and operating costs
Cleaner, chemical-light processing aligned with U.S. environmental standards

2. Which elements are we currently able to process and refine, and what are the sources of these materials?

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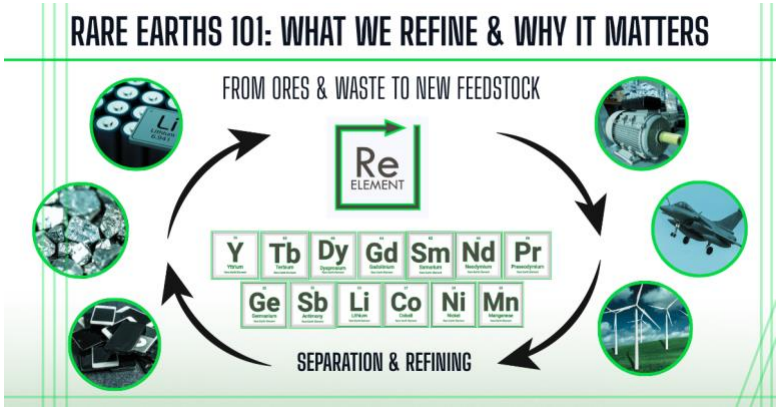


ReElement commercially produces separated and purified light and heavy rare earth elements and critical minerals for and from a wide range of feedstocks serving the electrification economy, national defense, advanced technologies and the mobility market.

What We Refine:
Some of the most in-demand elements we refine today include:

Heavy rare earth elements (HREEs)
Yttrium, terbium and dysprosium – essential in high-temperature applications, magnets, defense systems and advanced electronics, and among the most supply-constrained globally.

Medium rare earth elements
Gadolinium and samarium – used in high-temperature applications, magnets, imaging, specialized defense and industrial applications, and subject to increased supply constraints globally.

Light rare earth elements
Neodymium and praseodymium key ingredients in permanent magnets used in high-performance electric motors, wind turbines, and hard disk drives. While less scarce, these materials serve broader end markets.

Supply Constrained Critical Minerals
Germanium and antimony – used in advanced optics, fiber optics, munitions, flame retardants, batteries, advanced technologies, and subject to severe supply constraints.

Battery-grade materials
Battery materials - *including lithium, cobalt, nickel, and manganese* - continue to experience dynamic market conditions as electrification, energy storage, e-mobility, and battery chemistries evolve. We are able to separate and refine these materials from both primary and recycled sources, supporting the expansion of domestic manufacturing.

Where these materials come from
ReElement operates a multi-mineral, multi-feedstock refining platform, sourcing materials through diverse channels, including:

Recycled and circular sources

Electric motors and wind turbines
E-waste, hard disk drives (HDD), and military hardware
Pre-consumer manufacturing scrap
Lithium-ion batteries

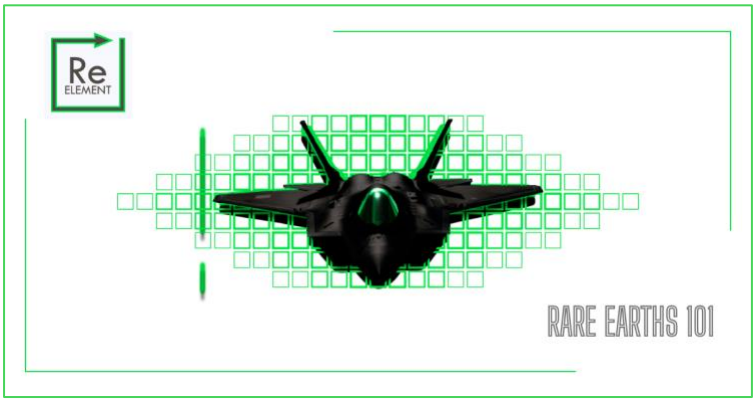
While we are often described as a recycler, ReElement is fundamentally a refiner, working closely with recyclers and manufacturers to efficiently close the loop and return critical minerals back into the U.S. supply chain.

Mined ores and concentrates
Through our former parent and affiliate, American Resources Corporation, and multiple global partnerships, we source mined ores and concentrates from domestic and international operations. Many rare earth and critical minerals are produced as byproducts of other mining activities, meaning mineral composition can vary significantly by source.

Why this matters:
Rare earth elements are not rare. Economically viable, scalable processing is.

This is exactly where ReElement is strategically positioned - unlocking value from diverse feedstocks and turning complex materials into high-purity products essential to modern technology and national security.

3. Yttrium + Gadolinium



At ReElement, we refine **yttrium and gadolinium on a separated basis** and can produce **99.9% to 99.999% purity**, depending on the end-market requirement.

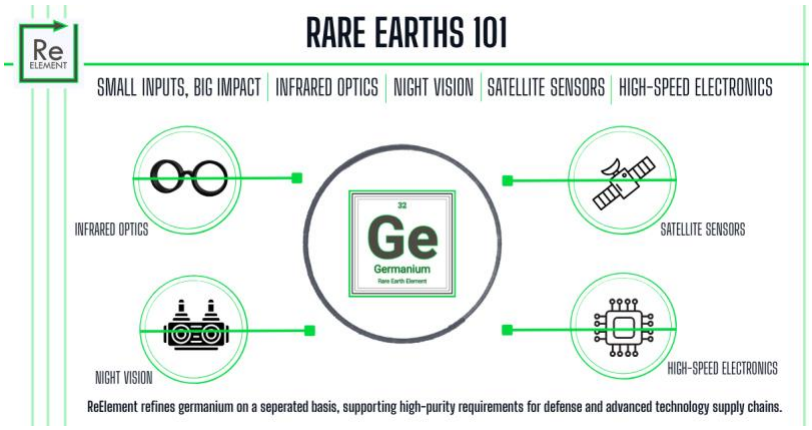
Why that matters:
These two lesser-known elements play outsized roles in advanced technologies, especially in defense and aerospace.

Yttrium is critical to laser systems, jet-engine alloys, missile guidance components, and high-temperature ceramics.

Gadolinium supports advanced sensors, neutron detection systems, and specialty alloys.

Here is the key point: high purity is not optional in these applications, and **global refining capacity is constrained**. ReElement is focused on expanding reliable access to ultra-high-purity yttrium and gadolinium for U.S. and allied supply chains.

4. Germanium



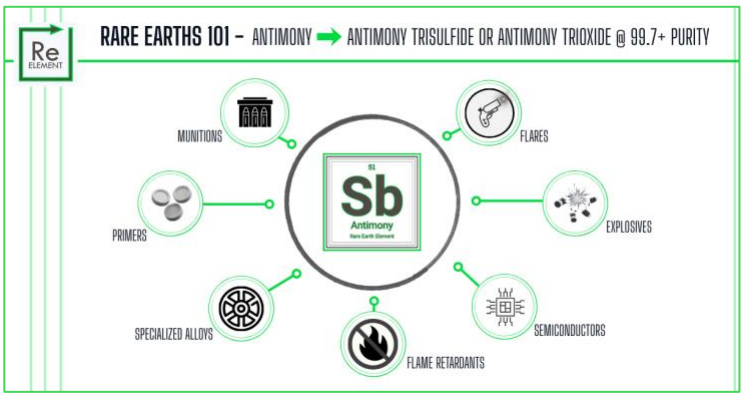
At ReElement, we refine **germanium on a separated basis** and can produce **99.9% to 99.999% purity**, depending on the end-market requirement.

Why that matters: germanium is essential for **infrared optics, night-vision systems, satellite sensors, and high-speed electronics**.

In many defense applications, the requirement is especially stringent. They often need **5N purity (99.999%)**.

Here is the key point: **global processing is heavily concentrated**, and **China currently dominates much of the world's germanium processing**. That reality elevates the importance of **U.S.-based refining** and reliable access to high-purity material.

5. Antimony



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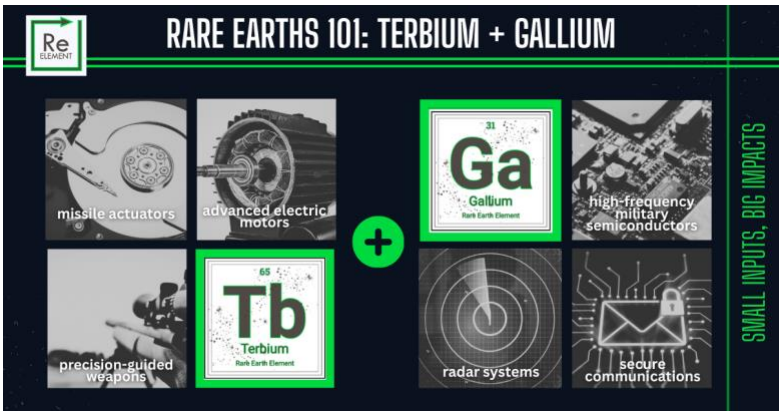
At ReElement, we refine **antimony** to **antimony trisulfide or antimony trioxide** at **99.7%+ purity**.

Why that matters: antimony, particularly **antimony trisulfide**, is a designated defense-critical material used in **munitions, primers, flares, and explosives**. It also supports **semiconductors, flame retardants, and specialized alloys**.

Here is the key point: the United States is **almost entirely dependent on foreign nations** for antimony supply. That dependence makes **domestic refining capacity strategically vital**, especially for defense and advanced manufacturing.

6. Terbium + Gallium



At ReElement, we refine **terbium and gallium on a separated basis** and can produce **99.5% to 99.999% purity**, depending on the end-market requirement.

Why this matters:
Terbium is essential for high-performance permanent **magnet alloys** used in **precision-guided weapons missile actuators, and advanced electric motors**.

Gallium is fundamental to **GaN (gallium nitride) power electronics**, including **radar systems, secure communications, and high-frequency military semiconductors**.

Here Is the key point: **both are considered "single point of failure" materials** for the U.S. defense supply chain because **global processing capacity is limited**. Expanding reliable, high-purity refining capacity is a **strategic priority** for the United States and its allies.

7. What differentiates ReElement, and why it matters

Across this series, we covered five practical questions: the problem, the sources, the elements we refine, where they go, and why refining on U.S. soil is strategically important.

Here is the summary in plain language.

ReElement is building a new model for domestic and allied-nation refining capacity. Our platform is designed to be deployed faster, operate with a smaller footprint than traditional refineries, and produce

ultra-high-purity outputs with a reduced environmental impact.

What that means for customers and partners:

High-purity capability, matched to end-market needs: We are separating and refining select materials to the purity levels demanding applications require.

A focused answer to the refining chokepoint: More refining capacity in the U.S. and allied nations reduces single points of failure in defense and advanced manufacturing supply chains.

Speed and siting flexibility: The ability to site quickly and co-locate near mining or concentrated assets can reduce logistics complexity and timelines.

Better economics: Smaller footprint and a more efficient approach can translate to reduced capital and operating costs.

Compatibility with U.S. environmental standards: Cleaner, solvent-free processing supports responsible scaling.

The takeaway is simple: **refining is where supply chains become secure, resilient, and scalable, and ReElement is helping move that capability onto U.S. soil and into allied ecosystems.**