

MINING

Visualizing How Rare Earths Power U.S. Defense

July 20, 2025

By **Bruno Venditti**

HOW RARE EARTHS

POWER U.S. DEFENSE

F-35 FIGHTER JET



- Guided missiles
- Lasers used to determine targets
- Drive motors

ARLEIGH BURKE DDG-51 DESTROYER



- Advanced radar systems
- Missile guidance systems
- Propulsion
- Drive motors

VIRGINIA-CLASS SUBMARINE



- Tomahawk missiles
- Radar systems
- Drive Motors

4,600 KG



Over **70%** of U.S. rare earth imports come from China

RARE EARTHS USED (KG)

418 KG

2,600 KG

KEY RARE EARTH ELEMENTS

60 Nd NEODYMIUM	59 Pr PRASEODYMIUM	62 Sm SAMARIUM
66 Dy DYSPROSIUM	65 Tb TERBIUM	63 Eu EUROPIUM
39 Y YTTRIUM		

60 Nd NEODYMIUM	59 Pr PRASEODYMIUM	62 Sm SAMARIUM
66 Dy DYSPROSIUM	65 Tb TERBIUM	57 La LANTHANUM
64 Gd GADOLINIUM	39 Y YTTRIUM	

60 Nd NEODYMIUM	59 Pr PRASEODYMIUM	62 Sm SAMARIUM
66 Dy DYSPROSIUM	65 Tb TERBIUM	57 La LANTHANUM
64 Gd GADOLINIUM	39 Y YTTRIUM	

EXCLUSIVE DATA PARTNER
BENCHMARK
benchmarkminerals.com

Source: Benchmark
Mineral Intelligence

VISUAL CAPITALIST

voronoi
BY VISUAL CAPITALIST

Where Data Tells the Story

Download on the
App Store

GET IT ON
Google Play

How Rare Earths Power U.S. Defense

Key Takeaways

- U.S. military platforms like the Virginia-class submarine and Arleigh Burke destroyer require thousands of kilograms of rare earth elements (REEs).
- F-35 Fighter jets alone use over 400 kg of REEs, essential for weapons targeting systems, lasers, and other advanced onboard technologies.

Rare earth elements (REEs) are essential components of advanced military technology. From fighter jets to submarines, these critical minerals power key systems that give the U.S. military a strategic edge.

This infographic explores the quantities of REEs used in major U.S. defense platforms and highlights their specific applications in modern warfare.

It reveals how different military equipment relies on rare earths not just in bulk, but for highly specialized roles, from laser-guided weapons to stealth capabilities.

Rare Earths in the F-35 Fighter Jet

The F-35 Lightning II requires around 418 kg of REEs per unit. These materials are used in advanced weapons targeting systems, radar, and laser technologies. Elements like neodymium and praseodymium are especially important in the permanent magnets that support flight control and stealth functions.

Equipment	REEs (kg)	Application Examples
F-35 Fighter Jet	418 kg	Guided missiles, Lasers used to determine targets
Arleigh Burke DDG-51 Destroyer	2600 kg	Advanced radar systems, Missile guidance systems, Propulsion
Virginia-Class Submarine	4600 kg	Tomahawk missiles, Radar systems, Drive Motors

Massive Demand from Naval Platforms

The Arleigh Burke-class destroyer and Virginia-class submarine are two of the U.S. Navy’s most sophisticated vessels. The destroyer uses about 2,600 kg of REEs, while the submarine demands a whopping 4,600 kg. These elements support radar, sonar, missile guidance, and propulsion systems critical for both offensive and defensive missions.

China’s Dominance in REE Supply

While these elements are crucial to U.S. defense, more than 70% of REE imports come from China. This dependence on a single geopolitical rival has raised strategic concerns in Washington, with the Trump administration making efforts to diversify supply chains and boost domestic production.

C26 and C27 Percentage Breakup

Rare Earth Percentage Breakup

