

60  
**Nd**  
Neodymium  
144.242

**Key Properties**

Atomic Mass	144.242
Category	Lanthanides
State at 20°C	solid
Melting Point	1016°C
Boiling Point	3074°C
Density	7.01
Electron Config	[Xe] 4f46s2
Electronegativity	1.14
Year Discovered	1885
Discovered By	Carl Auer von Welsbach

**Did You Know?**

- 1 Neodymium magnets (an alloy of neodymium, iron, and boron) are the strongest and most powerful type of permanent magnet known.
- 2 These powerful magnets are essential components in modern technology, found in headphones, computer hard drives, electric vehicle motors, and wind turbine generators.
- 3 Similar to praseodymium, neodymium is used in didymium glass for safety goggles, as it strongly absorbs yellow and green light.
- 4 It was named from the Greek words 'neos didymos', meaning 'new twin', because it was so difficult to separate from praseodymium.
- 5 When added to glass, it produces beautiful shades of lilac, purple, and wine-red.

**APPEARANCE**

Neodymium is a soft, silvery-white metal.

**SUPERHERO PERSONA**

"*Magneto, the hero with superhuman magnetic strength, powering everything from headphones to electric cars.*"

**EVERYDAY CONNECTION**

Neodymium is found in the tiny, powerful magnets in a pair of earbuds or a hard drive.

**POP CULTURE**

Neodymium is the key component of the magnets that power maglev trains and futuristic vehicles.

**Neodymium: The Metal Behind Powerful Magnets**

Neodymium is a silvery-white metal from the lanthanide family (often called rare earths). It tarnishes quickly when exposed to air. Its greatest claim to fame is being the key ingredient in the strongest permanent magnets we know of—magnets that power much of today's technology.

**Why Is Neodymium Useful?**

Neodymium's main role is in neodymium-iron-boron (NdFeB) magnets, discovered in 1983. These magnets are extremely powerful yet inexpensive, allowing electronics to become smaller and more efficient. They're found in:

Mobile phones Loudspeakers and microphones Headphones Wind turbines and electric vehicles Car windscreen wipers

**Other important uses include:**

Didymium Glass: Neodymium is part of special glass used in safety goggles for glassblowers and welders because it filters out the bright yellow flame.

Colored Glass: It gives glass beautiful tints—violet, wine-red, or gray—and is used in tanning lamps that let UV rays through while blocking heat.

Lasers: Neodymium glass lasers are used in eye and cosmetic surgery, and even to treat certain skin cancers.

**Natural Abundance & History**

Neodymium never occurs in pure form in nature but is found in minerals such as monazite and bastnaesite. It's extracted from these ores using ion-exchange and solvent-extraction methods. Pure neodymium metal is obtained by reducing its chloride or fluoride with calcium.

Discovery (1885): Austrian chemist Karl Auer von Welsbach discovered that "didymium"—once thought to be a single element—was actually two. He split it into neodymium ("new twin") and praseodymium ("green twin") using spectroscopy.

First Pure Sample (1925): Scientists succeeded in producing pure neodymium metal for the first time.

**Biological Role**

Neodymium has no known role in biology. It is considered moderately toxic and can irritate the eyes.