

74  
**W**  
**Tungsten**  
183.84

### Key Properties

Atomic Mass	183.84
Category	Transition Metals
State at 20°C	solid
Melting Point	3414°C
Boiling Point	5555°C
Density	19.25
Electron Config	[Xe] 4f145d46s2
Electronegativity	2.36
Year Discovered	1783
Discovered By	Fausto & Juan José Elhuyar

### Did You Know?

- 1 It has the highest melting point of all known elements, at a blistering 3,422 °C (6,192 °F).
- 2 Its chemical symbol, W, comes from its German name, 'Wolfram', which was derived from the mineral wolframite.
- 3 The filament in traditional incandescent light bulbs is made of a very thin coil of tungsten wire.
- 4 Because of its hardness and high density, it is used in armor-piercing ammunition and to make super-tough cutting tools.
- 5 Some bacteria use tungsten in enzymes, making it the heaviest known element to be used by any living organism.

#### APPEARANCE

Tungsten is a hard, steel-gray metal with the highest melting point.

#### SUPERHERO PERSONA

*"The Melting Point, the toughest hero who can withstand the most intense heat, from light bulb filaments to rocket nozzles."*

#### EVERYDAY CONNECTION

Tungsten is found in the filament in an old incandescent light bulb.

#### POP CULTURE

Tungsten is used to create the armor of the A-10 Warthog aircraft's cockpit.

## Tungsten: The Metal with the Highest Melting Point

Tungsten is a shiny, silvery-white metal famous for having the highest melting point of all metals—a scorching 3,422 °C! Its name comes from the Swedish words tung sten, meaning "heavy stone," because it's both dense and durable. These properties make tungsten essential for extreme heat and heavy-duty uses.

### Why Is Tungsten Useful?

Tungsten's strength and heat resistance give it a wide range of applications:

**Light Bulb Filaments:** Tungsten's most famous use was in old incandescent bulbs, where its high melting point let it glow white-hot without melting. While these bulbs are now less common, tungsten is still used in heating elements and arc-welding electrodes.

**Cutting Tools:** Tungsten carbide (tungsten + carbon) is one of the hardest materials known. It's used in drills, saw blades, and mining equipment.

**Lighting:** Tungsten compounds, like calcium and magnesium tungstate, are used in fluorescent lights.

**Alloys:** Tungsten is mixed with other metals to create super-strong, wear-resistant alloys for military, aerospace, and industrial uses.

### Biological Role & Natural Abundance

Unusually for such a heavy metal, tungsten plays a role in biology—some bacteria use it in enzymes to help convert chemicals for survival.

Tungsten is never found in pure form. Its main ores are scheelite and wolframite. Commercially, it's obtained by reducing tungsten oxide with hydrogen or carbon.

### History of Discovery

**Early Uses:** Over 350 years ago, Chinese porcelain makers used a tungsten compound to produce a peach-colored glaze.

**1781 – First Step:** Swedish chemist Carl Wilhelm Scheele isolated a new oxide from the mineral scheelite, realizing it came from an unknown metal.

**1783 – Pure Metal:** Spanish brothers Juan and Fausto Elhuyar reduced this oxide with carbon to isolate pure tungsten, earning credit for the discovery.