Melting Points of Metals: A Comprehensive Chart

In modern machining, materials science, and heat treatment processes, having accurate data on metal melting points is essential for setting cutting parameters, selecting tooling materials, and evaluating thermal loads. This chart categorizes common metals by their industrial applications, providing precise reference data in both Celsius (°C) and Fahrenheit (°F).

1. Core Engineering & Structural Metals

These metals form the backbone of mechanical manufacturing and serve as the base materials for the vast majority of common alloys.

Metal	Symbol	Melting Point (°C)	Melting Point (°F)
Titanium	**Ti**	1668 °C	3034 °F
Iron	**Fe**	1538 °C	2800 °F
Cobalt	**Co**	1495 °C	2723 °F
Nickel	**Ni**	1455 °C	2651 °F
Copper	**Cu**	1085 °C	1984 °F
Aluminum	**Al**	660 °C	1220 °F
Magnesium	**Mg**	650 °C	1202 °F
Zinc	**Zn**	419 °C	787 °F

Summary: The melting points of these pure metals provide the most intuitive baseline for evaluating the thermal limits of everyday CNC machining.

2. Refractory & Tooling Metals

Renowned for their extreme heat resistance, refractory metals are critical for manufacturing high-performance cutting tools and aerospace components.

Metal	Symbol	Melting Point (°C)	Melting Point (°F)
Tungsten	**W**	3422 °C	6192 °F
Rhenium	**Re**	3186 °C	5767 °F
Tantalum	**Ta**	3017 °C	5463 °F
Molybdenum	**Mo**	2623 °C	4753 °F
Niobium	**Nb**	2477 °C	4491 °F
Chromium	**Cr**	1907 °C	3465 °F

Summary: Their exceptionally high melting points mean they maintain outstanding physical strength even under extreme thermodynamic stress.

3. Precious Metals

Precious metals play an irreplaceable role in precision electronics, medical devices, and aerospace sensors.

Metal	Symbol	Melting Point (°C)	Melting Point (°F)
Rhodium	**Rh**	1964 °C	3567 °F
Platinum	**Pt**	1768 °C	3215 °F
Palladium	**Pd**	1555 °C	2831 °F
Gold	**Au**	1064 °C	1947 °F
Silver	**Ag**	961 °C	1762 °F

Summary: Beyond their wide range of melting points, these metals are globally recognized for their superior corrosion resistance and electrical conductivity.

4. Low-Melting-Point Metals

Typically used to improve alloy machinability, for specialized welding (brazing/soldering), or in low-temperature casting.

Metal	Symbol	Melting Point (°C)	Melting Point (°F)
Antimony	**Sb**	631 °C	1167 °F
Lead	**Pb**	327 °C	621 °F
Tin	**Sn**	232 °C	450 °F
Indium	**In**	156 °C	313 °F
Gallium	**Ga**	30 °C	86 °F
Mercury	**Hg**	-39 °C	-38 °F

Summary: Understanding these low-melting characteristics is crucial for precise temperature control in specialized machining and semiconductor manufacturing.

💡 Engineering Notes: Pure Metals vs. Alloys

When applying this chart in actual production, it is vital to distinguish the thermodynamic differences between pure elements and alloys:

- **Pure Metals:** Have a single, absolute melting point (as shown in the tables above).
- **Industrial Alloys:** Materials like 304 Stainless Steel or 6061 Aluminum do not have a single melting point. Instead, they melt gradually over a "temperature range" between the **Solidus** (where melting begins) and the **Liquidus** (where the metal is fully liquid).

> *Note: During high-speed machining, as temperatures approach the solidus line, the material will soften significantly, often leading to tool adhesion (built-up edge).*