

MATERIAL DATA SHEET · REFRACTORY METAL

Molybdenum (Mo)

Atomic Number 42 | Period 5 | Group 6 | CAS 7439-98-7

Molybdenum combines a high melting point with excellent thermal conductivity and a very low coefficient of thermal expansion. This makes it the preferred material for high-temperature furnaces, sapphire crystal growth, semiconductor manufacturing and glass technology. Refracore supplies pure Mo as well as all major alloys: TZM, MHC, Mo-La, Mo-Cu and more.

2,623 °C

Melting Point

10.2 g/cm³

Density

320 GPa

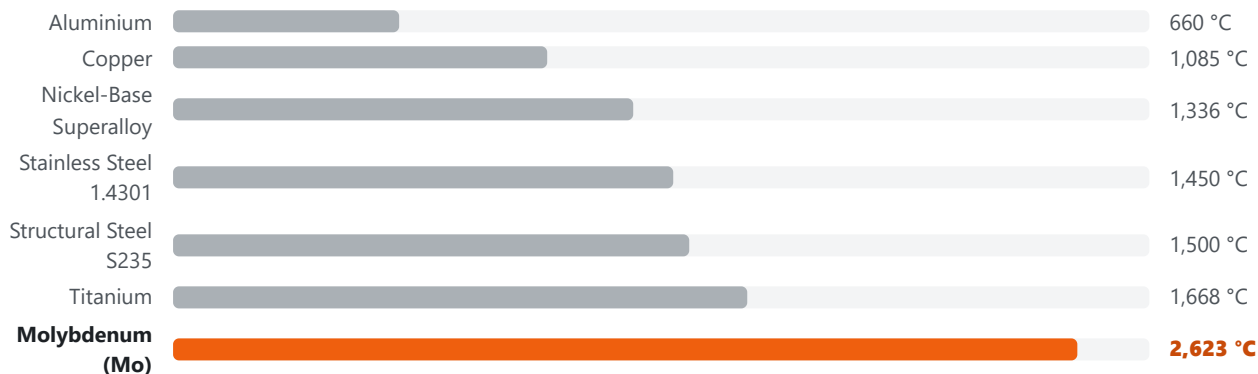
Young's Modulus

138 W/(m·K)

Thermal Conductivity

Melting Point Compared to Standard Materials

Melting point in °C — molybdenum lies well above all common structural materials.



Physical & Mechanical Properties

Melting Point	2,623 °C	Boiling Point	5,560 °C
Density (pure)	10.2 g/cm ³	Young's Modulus	320 GPa
Vickers Hardness (annealed)	160–220 HV	Tensile Strength (annealed)	450–570 MPa
Thermal Conductivity	138 W/(m·K)	Thermal Expansion (20–500°C)	4.8 µm/m·K
Electrical Resistivity	5.2 µΩ·cm	Recrystallisation (pure Mo)	900–1,200 °C
Service Temperature (vacuum)	up to 2,200 °C	Purity (Standard)	≥ 99.97 %

Standards & Specifications: ASTM B386 (sheet), ASTM B387 (rod), ASTM B388 (wire)

Available Alloys & Variants

DESIGNATION	COMPOSITION	SPECIAL FEATURE / ADVANTAGE
Pure Mo	≥ 99.97% Mo	Standard grade, best price-to-performance ratio in its class
TZM	Mo-0.5Ti-0.08Zr-0.02C	Recrystallisation > 1,400 °C, higher creep resistance
MHC	Mo-1.2Hf-0.1C	Recrystallisation > 1,550 °C, highest stability, glass industry
Mo-La	Mo + 0.3–0.7% La ₂ O ₃	Recrystallisation > 1,700 °C, heating conductors, ODS alloy
Mo-Cu	Mo70Cu30 / Mo85Cu15	Thermal conductivity 160–220 W/(m·K), CTE 7–9 µm/m·K, 50% lighter than W-Cu

Delivery Forms & Dimensions

DELIVERY FORM	DIMENSIONS / DETAILS
Sheet / Foil	0.05–20 mm thickness, width up to 600 mm
Rod / Bar	Ø 2–120 mm, length up to 3,000 mm
Tube / Crucible	Outer Ø 10–200 mm, wall thickness 1–20 mm
Disc	Ø 10–400 mm
Sputtering Target	Round / rectangular, ≥ 99.99%, > 99.5% TD
Heating Element	Meander / coil, made to drawing
Custom Part / CNC	Made to drawing, tolerance classes by agreement

Applications & Industries

INDUSTRY / APPLICATION	TYPICAL COMPONENTS / PRODUCTS
High-Temperature Furnaces	Heating elements, radiant elements, insulation shields (up to 2,200 °C in vacuum)
Sapphire Crystal Growth	Crucibles, thermal-field components for LED manufacturing
Semiconductors	Sputtering targets, backing plates for PVD/CVD processes
Glass Technology	Electrodes for glass melting, bushing plates (MHC)
Aerospace	Structural parts, moulds, dies (TZM)
Electronics / Packaging	Mo-Cu substrates, heat sinks for RF electronics

Note: Molybdenum oxidises in air from approx. 300 °C. High-temperature applications in air require protective coatings or an inert gas atmosphere. Usable in vacuum and under H₂ up to 2,200 °C.

Quality & Certificates

ISO 9001

3.1 Mill Certificate to EN 10204

RoHS-Compliant

REACH-Compliant

Consultation in German & English

Inquiry & Consultation

Material, alloy, dimensions, tolerances and certificates – we advise free of charge and prepare your quote within 1–2 business days.

info@refracore.de

+49 2353 669933-0

refracore.de