

Molybdenum

Refractory Metals and Alloys

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42

Mo

95.94

Molybdenum

Molybdenum is an excellent material due to its unique mechanical and chemical properties that can meet the most demanding application requirements in many diverse industries. Molybdenum is best categorized as a refractory metal due to its very high melting point, low coefficient of thermal expansion and a high level of thermal conductivity. The strength of Molybdenum increases the more the metal is cold worked. Pure Molybdenum is conducive to many applications in high-temperature furnace building because of its excellent availability, good workability and favorable high-temperature properties, such as low vapor pressure and high melting point.

APPLICATIONS

Structural furnace members, windings and components, containers for components exposed to high temperatures, nose cones, nozzles, support vanes, heat radiation shields, cathodes, magnetron end hats, x-ray tube components, high temperature applications.

Typical Physical Properties

Density	g/cm ³	10.22
Melting Point	°F	4748
	°C	2620
Specific Electrical Resistance	(Ω mm ²)/m	0.056
Specific Heat@ 20°C	J/(gK)	0.254
Recrystallization Temp		1100
Thermal Conductivity@ 20°C	W/(m-K)	142
Coefficient of Linear Thermal Expansion@ 20°C	m/(m-K)	5.2 x 10 ⁻⁶

*Temp C for 100% recrystallization. One hour annealing time.
Deformation level + 90% Source: Plansee

Typical Mechanical Properties

		<u>Stress Relieved</u>	<u>Recrystallized</u>
Tensile Strength (R _m)	MPa-20 °C	800	500
	MPa-1000 °C	230	150
	MPa-1400 °C	60	60
Elongation	%-20°C	20	50
	%-1000°C	10	40
	%-1400°C	40	40
Typical Hardness	HV10	> 220	160-180
Modulus of Elasticity @ 20°C	GPa	320	
	@2000°C	GPa	160

*2mm sheet, longitudinal direction Source: www.plansee.com

Forms | Sizes

Plate	0.1875"- 1.500"
Round Bar Rod	0.040"- 4.00"
Sheet	0.005"- 0.125"
Coiled Sheet	0.005"- 0.015"
Threaded Rod & Hex Nuts	Various
Wire	0.001"- 0.100"

Listed above are our standard stock items. Our inventory fluctuates based on market demands. If you do not see the size or form you require, please call us.

Typical Application



Vacuum Furnace Parts

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CHEMISTRY

C 0.010 max., O 0.0070 max., N 0.0020 max., Fe 0.010, Ni 0.005 max., Si 0.010 max., Mo Balance >99.95

(Source: ASTM B386 & B387 Type 1 Table 1 Chemical Requirement)



Specifications

MS 7800, ASTM B386 Type 361 (Plate + Sheet), B387 Type 361 (Round Bar), CAS 7439-98-7, UNS R03610

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EFINEA METALS | www.efineametals.com | sales@efineametals.com

Special Purpose Alloys & Metal From Stock

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EFINEA Services

Slitting, Sheering, Grinding, Water Jet Cutting, Laser Cutting, Saw Cutting, Custom Stocking and Consignment Programs

Just-In-Time-Delivery

All of our standard stock items can be shipped within 24-hours of your order confirmation and most are shipped the same day. All materials certified with shipment. For special orders and non-stock materials, contact our sales team for our competitive pricing and delivery lead times

Controlled Expansion | Glass Sealing

EFINEA Supplies the highest quality metals and alloys including materials from Carpenter Technology Corp.

Kovar® | ASTM F15® Alloy

Forms: Plate, Round Bar/Rod, Sheet, Strip/Coil

Trade Names: Kovar, Pernifer®, 2918, NILO K®, DilverP1®

Alloy 42 / 46 / 48 / 52

Forms: Plate, Round Bar/Rod, Sheet, Strip/Coil

Trade Names: Pernifer®40, 46, 48, 50, NILO®42, 46, 48; Glass Sealing 42, 46, 48, 52

Free-Cut Invar "36"® Alloy

Forms: Round Bar/Rod

Invar "36" Alloy

Forms: Plate Sheet

Trade Names: Pernifer® 36, NILO®36, Invar

Super Invar 32-5®

Forms: Plate, Round Bar/Rod, Sheet

Refractory Metals & Alloys

EFINEA is your leading source for quality refractory metals & alloys. We stock DFARS Molybdenum, ML/MLS/MLR, Molybdenum TZM Tantalum & Tungsten manufactured from Plansee

Molybdenum

Forms: Plate, Round Bar/Rod, Sheet/Coiled Sheet, Threaded Rod/Nuts, Wire

Molybdenum Lanthanum Oxide (ML)

Forms: Sheet-Stress Relieved, Recrystallized

Molybdenum TZM

Forms: Plate, Round Bar/Rod, Sheet

Niobium

Forms: Plate, Round Bar/Rod, Sheet, Strip/Coil

Rhenium

Forms: Plate, Round Bar/Rod, Sheet, Strip/Coil

Tantalum

Forms: Plate, Round Bar/Rod, Sheet, Strip/Coil, Wire

Tungsten

Forms: Plate, Precision Cut wire, Round Bar/Rod, Sheet

Tungsten Alloys

Forms: Blanks, Flats, Parts, Plate/Sheet, Rod, Shapes

Soft Magnetic Alloys | EMI Shielding & Laminations

EFINEA is a distributor of "EMI shielding alloys" for VDM Metals GmbH the world's leading producer of these alloys.

EFINEA Alloy 50

Forms: Round Bar/Rod, Square Bar, Strip/Coil, Wire Rod

Trade Names: High Permeability 49®, Mangnifer®50

EFINEA Alloy 79

Forms: Rectangular Bar, Round Bar/Rod, Sheet, Strip/Coil

Trade Names: Hipernom, HyMu80 Magnifer®7904, Molypermalloy, Permalloy 80®

Hiperco®50

Forms: Strip/Coil

Hiperco®50A

Forms: Plate, Round Bar/Rod, Strip/Coil

Hiperco®50 HS

Forms: Strip/Coil

Core Iron (Pure Iron)

Forms: Round Bar/Rod, Plate

Trade Names: Electrical Iron®, Alliedpureiron®

Electrical & Electronic Nickels

EFINEA supplies select, Commercially pure grades of Nickel in various forms and sizes.

Electronic Nickels

200/201/205/233/270

Forms: Plate, Round Bar/Rod, Sheet, Strip/Coil, Wire

Copper Metals

EFINEA supplies select, Commercially pure grades of Copper in Coil Form

Copper OFHC 101/102

Nickel-Silver 770

Cupro-Nickel 715 (CuNi 70/30)

Forms: Coil

Stainless Steels & Other Alloys

EFINEA supplies select aircraft quality grades of Stainless Steel available in various forms and sizes.

17-4PH (Type 630)

15-5PH Vac Melt

300 Grade Stainless Steel Coils

Forms: Round Bar/Coils