

Molybdenum

TZM

Refractory Metals and Alloys

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Mo95.94
Molybdenum²²
Ti47.87
Titanium⁴⁰
Zr91.22
Zirconium

Molybdenum TZM, a refractory alloy, comprised of 0.5% titanium (Ti), 0.08% zirconium (Zr), 0.01 - 0.04% carbon (C), and the balance being the element molybdenum. This alloy is produced by powder metallurgy techniques with the addition of particle-strengthened carbides and oxides to inhibit grain growth at high temperatures. This combination provides increases in the alloy's ductility and creep strength. One of molybdenum TZM most significant improvements is that above 2000°F its tensile strength is approximately twice that of pure molybdenum. TZM is best used for applications where components are subjected to both high temperature environments and high mechanical loading.

APPLICATIONS

Components for HIP, sintering, and heat treatment furnaces; X-ray target base bodies; Boats for annealing and sintering (up to 1400°C); Forming tools: hot runner nozzles for plastic injection molding; Billets for isothermal forging; Die inserts for casting aluminum.

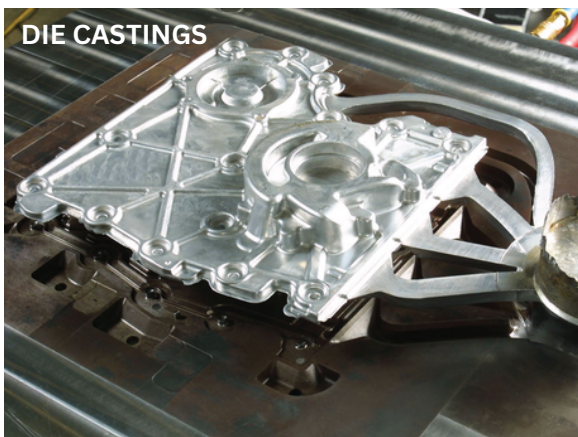
Typical Physical Properties

Density	lb/in ³	0.37
	g/cm ³	10.22
Melting Point	°F	4753
	°C	2623
Electrical Resistivity	Micro-ohm-cm	6.85
Thermal Conductivity	Cal/cm ² /cm ² /sec	0.48
Specific Heat	Cal/gm/°C	0.073
Recrystallization Temp	°C	1400
Coefficient of Linear Thermal Expansion	Micro-in/°F × 10 ⁻⁶	2.50
	Micro-in/°C × 10 ⁻⁶	5.20

Typical Mechanical Properties

Tensile Strength	KSI (MPa) RT	110 (760)
Elongation	% in 1.0"	15
Typical Hardness	DPH/RC	220
Modulus of Elasticity	KSI (GPa)	48 (320)

DIE CASTINGS



Forms | Sizes

Plate	0.1875"-1.50"
Round Bar Rod	0.125"-3.937"
Sheet	0.039"-.125"

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.

CHEMISTRY

99.2 Molybdenum (Mo) Minimum
0.50 Titanium (Ti), 0.08 Zirconium (Zr), 0.01-0.04 Carbon (C)



Specifications

ASTM B 386 Type 364, (Plate, Sheet, Coil) & ASTM B 387 Type 364 (Rod & Wire), UNS R03634

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