

# Molybdenum

## TZM

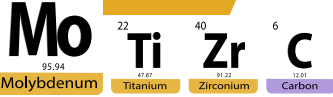
### Refractory Metals and Alloys

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**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.

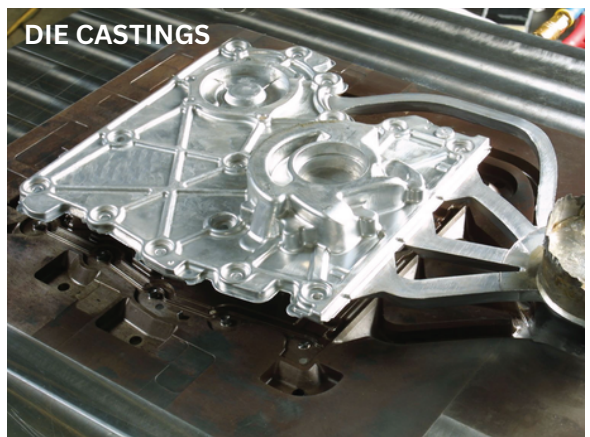
#### Typical Physical Properties

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

#### Typical Mechanical Properties

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

#### DIE CASTINGS



#### Forms | Sizes

Plate	----
Round Bar   Rod	----
Sheet	----

Please call us at 800-348-6268 with your form and size requirements. No order is too small

#### CHEMISTRY

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



#### Specifications

ASTM B386 Type 364, ASTM B387 Type 364, UNS R03630