



Tantalum Wire and Tubing

Tantalum is one of the refractory metals. Its melting point of 5425°F (2996° C) is exceeded only by tungsten, rhenium and carbon. It exhibits excellent corrosion resistance and high temperature strength. At low temperatures its resistance to most acids (except hydrofluoric) is comparable to glass and platinum. It is also completely resistant to attack by many molten metals. It exhibits good ductility at room temperature is readily fabricated and welded.

The combination of fabricability, strength and corrosion resistance has made tantalum a favorite material for the chemical and food processing industries. Tantalum is susceptible to hydrogen embrittlement and should not be allowed to become cathodic in the presence of hydrogen ions or gas. It should not be used in such environments in electrolytic contact with materials such as nickel and its alloys and stainless or carbon steels.

Due to its workability, high temperature strength, corrosion resistance, and excellent thermal conductivity, tantalum tubing can be a good choice for thermocouple protection tubes for many applications from room temperature to over 5000°F., depending upon the atmosphere. Continuous operation in air should be limited to a maximum temperature of about 750°F. In vacuum, tantalum can be safely used to 5000°F. Operation at elevated temperatures in oxygen, nitrogen or hydrogen environments should be avoided due to embrittlement.

	Tantalum	Molybdenum
Melting Point	5425°F 2996°C	4730°F 2610°C
Density, #/in. ³ g/cm ³	.60 16.6	.369 10.22
Thermal Exp., per °C per °F	6.5 x 10 ⁻⁶ 3.6 x 10 ⁻⁶	4.9 x 10 ⁻⁶ 2.7 x 10 ⁻⁶
Thermal Conductivity, W/(m·K) Btu/(h·ft·°F)	54.4 31.4	142 81.9

Composition, maximum wt. %
ASTM B365 (wire) and ASTM B521 (tubing)
R05200

C	O	N	H	Nb	Fe	Ti	W	Mo	Si	Ni	Ta
.010	.015	.010	.0015	.10	.010	.010	.050	.020	.005	.010	Bal.