



Hamilton Precision Metals
1780 Rohrerstown Road, Lancaster, PA 17602
Phone: (717) 569-7061 Fax: (717) 569-7642

TECHNICAL DATA SHEET

TANTALUM

Unalloyed Tantalum is supplied to ASTM F560 – R05200 composition limits. Tantalum is selected for its corrosion resistance, thermal conductivity, high melting point, and ability to form a dielectric oxide film.

NOMINAL COMPOSITION:

Carbon	.010%	Titanium	.010%
Oxygen	.0150%	Tungsten	.05%
Nitrogen	.010%	Molybdenum	.020%
Hydrogen	.0015%	Silicon	.0050%
Niobium	.100%	Nickel	.010%
Iron	.010%	Tantalum	Balance

TYPICAL MECHANICAL PROPERTIES:¹

	<u>ANNEALED</u>	<u>COLD ROLLED (90%)</u>
Ultimate Tensile Strength	40,000 psi	125, 000 psi
Yield Strength (.2% Offset)	26,000 psi	118, 000 psi
Elongation in 2”*	50%	2%
Modulus of Elasticity	26 X 10 ⁶ psi	
Hardness	35 HRb	20 HRc

Tantalum can also be provided in the cold rolled and stress relieved condition to ASTM F560 limits.

*Measured elongation will be less as thickness decreases to .002” and less.

¹ These values may be adjusted by control of process variables – consult HPM for desired values.

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PHYSICAL PROPERTIES:²

Density	-	0.602 lb/in ³
Melting Point	-	2996 °C
Electrical Resistivity @ R.T.	-	12.5 microhm-cm
Thermal Conductivity @ R.T.	-	54.4 W/m-K
Thermal Expansion Coefficient		
(20 to 500 C)	-	6.7 X 10 ⁻⁶ /°C
(20 to 1000 C)	-	6.96 X 10 ⁻⁶ /°C
Temperature Coefficient of Resistivity	-	3820 ppm/°C

GENERAL INFORMATION:

Tantalum is very ductile and can be readily cold formed due to a low work hardening rate. Welding can be accomplished via resistance, TIG, or electron beam methods, with care taken to protect the weld and heat affected zone from air during welding. Because of the potential for hydrogen embrittlement, Tantalum can not be used for extended service in air or other oxidizing atmospheres above 260 °C unless a protective inert atmosphere or vacuum is provided.

AVAILABILITY:

Tantalum is available from Hamilton Precision Metals as strip product from .0005” to .035” in widths up to 12.0”. The material conforms to UNS R05200 and meets the requirements of ASTM F560 and ASTM B708.

² Typical values to guide alloy selection but are not a guarantee of minimum or maximum.