

Advanced Probing Systems, Inc. – Data Sheet

TUNGSTEN, TUNGSTEN-RHENIUM, AND BERYLLIUM-COPPER MATERIAL PROPERTIES

PROPERTIES	TUNGSTEN	TUNGSTEN RHENIUM	BERYLLIUM COPPER
<i>Physical Properties:</i>			
Density ^a (gm/cm ³)	19.24	19.29	8.35
<i>Electrical Properties:</i>			
Resistivity at 20°C ^b (μohm-cm)	5.59 to 5.86	9.15 to 9.65	6.10 to 7.93
Conductivity at 20°C ^b (1/Mohm-cm)	0.179 to 0.170	0.109 to 0.104	0.131 to 0.126
<i>Thermal Properties:</i>			
Melting Point (°C)	3410	3108	870 to 980
Coeff. of Lin. Exp. (0 to 500 °C) (mm/mm × 1/°C)	4.45 × 10 ⁻⁶	4.92 × 10 ⁻⁶	1.78 × 10 ⁻⁵
<i>Material Properties:</i>			
Elastic Modulus ^c (GPa)	394.5±6.1	395.7±6.4	131.5±5.5
Tensile Yield Strength (GPa)	2.65 to 2.90	2.90 to 3.36	1.38 to 1.64
Flexural Yield Strength ^c (GPa)	5.52 to 6.05	5.95 to 6.48	2.90 to 3.10
Ultimate Tensile Strength (GPa)	4.25 to 4.85	5.00 to 5.75	2.70 to 3.00
Ultimate Flexural Strength ^c (GPa)	9.02 to 9.30	10.00 to 10.89	4.00 to 4.65
Knoop Hardness (100 gm load) ^b (kg/mm ²)	705 to 832	818 to 891	300 to 350
Vicker's Hardness (100 gm load) ^b (kg/mm ²)	665 to 738	745 to 877	288 to 325

Note: Due to the cold-working that occurs during the wire drawing process, the electrical, strength, and hardness values are dependent upon the wire diameter.

a - Values were obtained experimentally via Archimedes' Principle using 0.008 to 0.012 inch diameter probes.

b - Values were obtained experimentally from 0.005 to 0.012 inch diameter probes.

c - Values were obtained experimentally via three-point bend testing of 0.008 to 0.012 inch diameter probes.

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