MATERION

Data Sheet

C72900 ToughMet® 3 Alloy Wire

ToughMet 3 Alloy is a performance, heat treatable, copper-nickel-tin alloy designed for severe service applications. Compared to other higher performance alloys, ToughMet 3 Alloy's properties provide customers with greater design flexibility in miniaturized applications, improved reliability with millions of flexural cycles, greater tolerance of large deflections, and longer life at elevated temperatures. The alloy's superior performance derives from exceptional yield strength, elastic limit, fatigue strength and resistance to stress relaxation at elevated temperatures. Heat treatment of ToughMet 3 Alloy is a simple process that provides parts with exceptionally high strength and very little dimensional distortion. The recommended heat treatment at 700°F/370°C provides peak strength. ToughMet 3 Alloy parts are corrosion resistant and resist atmospheric tarnishing; parts can be electroplated for additional corrosion protection.

Chemical Composition (Weight Percent)

Alloy	Nickel	Tin	Copper
C72900	15%	8%	Balance

Typical Physical Properties*

Elastic Modulus	Density	Thermal Expansion Coefficient	Electrical Conductivity/ Resistivity	Relative Magnetic Permeability	Stress Relaxation Resistance (Force Remaining after 1000 hrs.)	
					at 150 °C	At 200 °C
21,000 ksi 144 GPa	0.325 lb/in^3 9.0 g/cm^3	9.1 x 10^{-6} in/in °F 16.4 x 10^{-6} m/m °C	7% IACS 4 MS/m	< 1.01	90%	80%

*Properties specified for the spinodally hardened (heat treated) condition.

Typical Mechanical Properties*

Temper**	Heat Treatment	0.2% Offset Yield Strength		Ultimate Tensile Strength		Elongation	Hardness
		ksi	MPa	ksi	MPa	Percent	HV
A (TB00) ¼ H (TD01) H (TD04)	Before Heat Treatment	20 - 50 70 - 90 130 - 160	140 - 345 485 - 620 895 - 1105	60 - 90 75 - 105 135 - 165	415 - 620 515 - 725 930 - 1140	30 - 60 10 - 25 3 - 15	120 - 160 180 - 220 270 - 310
AT (TX00) ¼ HT (TX01) HT (TX04)	After 3 hours at 700°F/370°C	90 - 120 120 - 150 180 - 210	620 - 825 825 - 1035 1240 - 1450	120 - 150 135 - 165 185 - 215	825 - 1035 930 - 1140 1275 - 1480	10 min 5 min 2 min	270 - 310 360 - 400 380 - 420

*Properties may vary by diameter.
**Wire is typically provided in an annealed or cold drawn temper and heat treated after forming.

Forms Available

ToughMet 3 Alloy wire is supplied in loose coils or on spools or reels. ToughMet 3 Alloy is also available in rod, bar, plate, tube and in parts finished by forging or extrusion.

Industry Standards and Specifications

UNS C72900

Tolerances

Wire Diameter (Inches)		Standard Diameter Tolerance (inches)		Wire Diameter (mm)		Standard Diameter Tolerance (mm)	
Over	Including	Cold Drawn Tempers	Annealed Temper	Over	Including	Cold Drawn Tempers	Annealed Temper
0.0300	0.0800	± 0.0003	± 0.001	0.76	1.50	± 0.01	± 0.03
0.0800	0.1250	± 0.0004	± 0.002	1.50	2.0	± 0.01	± 0.03
0.1250	0.2500	± 0.0006	± 0.002	2.0	3.8	± 0.02	± 0.05
0.2500	0.3125	± 0.0007	± 0.002	3.8	12.0	± 0.03	± 0.05
0.3125	0.5000	± 0.0010	± 0.002				

Additional tolerances are per ASTM B250. Please specify the exact tolerances that you require when you place your order. Tighter tolerances may be available at additional cost. Please contact your local sales engineer to confirm the requested capability.

Related Information

Additional technical or safe handling information on ToughMet 3 Alloy may be obtained by phoning +1.800.375.4205. For pricing and availability, please call +1.800.521.8800.

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