MATERION

DATA SHEET

Alloy 3 (C17510) Wire

Materion's Alloy 3 wire provides good strength with high electrical conductivity and excellent resistance to stress relaxation. Typical applications include coil springs and formed wire contacts.

Chemical Composition (Weight Percent)

Nickel	Beryllium	Copper
1.4 – 2.2	0.2 – 0.6	Balance

Typical Physical Properties*

Elastic Modulus	Melting Point (Solidus)	Electrical Conductivity/ Resistivity	Density**	Thermal Expansion Coefficient	Thermal Conductivity (25°C)
20,000 ksi 138 GPa	1900°F 1040°C	45 - 60% IACS 2.9 - 3.8 μΩ-cm	0.319 lb./in^3 8.83 g/cm^3	9.8 x 10^{-6} in/in °F 17.6 x 10^{-6} m/m °C	140 BTU/ft hr °F 240 W/m °C

*Properties specified for the precipitation age hardened (heat treated) condition.
**Value listed is the density after heat treatment. The density before heat treatment is 0.316 lb./in^3 (8.75 g/cm^3).

Typical Mechanical Properties*

Temper**	Heat Treatment Required	0.2% Offset Yield Strength		Ultimate Tensile Strength		Elongation***
	900 - 925 °F 480 - 495 °C	ksi	MPa	ksi	MPa	Percent
A (TB00) H (TD04	Before Heat Treatment	10 - 30 55 - 75	70 - 210 370 - 520	35 - 55 65 - 80	240 - 380 450 - 560	20 - 60 2 - 20
AT (TF00) HT (TH04)	After 3 hours After 2 hours	80 - 110 95 - 125	550 - 760 650 - 870	100 - 130 110 - 140	680 - 900 750 - 970	10 min. 10 min.

*Properties may vary by diameter.
**Wire is typically provided in an annealed or cold drawn temper and heat treated after forming. In special cases, wire may also be provided pretempered (heat treated).
***Elongation numbers are valid only for wire greater than 0.004" (0.10 mm) diameter.

Forms Available

Alloy 3 wire is supplied in loose coils or on spools or reels. It is available in diameters ranging from 0.05" to 0.5" (1.27 mm to 12.7 mm). Smaller diameter wire may be produced by a number of wire redrawers. Alloy 3 is also available in rod, bar, plate, tube, strip, and parts finished by drawing, extrusion, and machining.

Industry Standards and Specifications

C17510

Related Information

Additional technical or safe handling information on Alloy 3 wire may be obtained by calling +1.800.375.4205 (+1.216.383.6800). For sales inquiries and more information, call +1.800.521.8800.

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	0.8	2.0	± 0.008	± 0.025
0.0800	0.1250	± 0.0004	± 0.002	2.0	3.2	± 0.010	± 0.050
0.1250	0.2500	± 0.0006	± 0.002	3.2	6.4	± 0.015	± 0.050
0.2500	0.3125	± 0.0007	± 0.002	6.4	8.0	± 0.018	± 0.050
0.3125	0.4060	± 0.0010	± 0.002	8.0	10	± 0.025	± 0.050
0.4060	0.5000	± 0.0010	± 0.002	10	12	± 0.025	± 0.050

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

Health and Safety

Processing beryllium-containing alloys poses a health risk if safe practices are not followed. Inhalation of airborne beryllium can cause serious lung diseases in some individuals. Occupational safety and health regulatory agencies worldwide have set mandatory limits on occupational respiratory exposures. Read and follow the guidance in the Safety Data Sheet (SDS) before working with this material. The SDS and additional important beryllium health and safety information and guidance can be found at berylliumsafety.com, berylliumsafety.eu and Materion.com. For questions on safe practices for beryllium-containing alloys, contact the Materion Product Stewardship Group at +1.800.862.4118 or contact us by email at Materion-PS@Materion.com

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