

Alloys 3 (C17510) and 10 (C17500) Wire

Materion Performance Alloys 3 and 10 wire provide good strength with high electrical conductivity and good resistance to stress relaxation. Typical applications include coil springs and formed wire contacts.



CHEMICAL COMPOSITION (weight percent)

Alloy	UNS Number	Beryllium	Nickel	Cobalt	Copper
3	C17510	0.2 – 0.6	1.4 – 2.2	–	Balance
10	C17500	0.4 – 0.7	–	2.4 – 2.7	Balance

PHYSICAL PROPERTIES*

Alloy	Elastic Modulus	Melting Point (Solidus)	Electrical Conductivity/ Resistivity	Density**	Thermal Expansion Coefficient	Thermal Conductivity (25 °C)
3	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	9.8×10 ⁻⁶ in/in °F 17.6×10 ⁻⁶ m/m °C	140 BTU/ft hr °F 240 W/m °C
10	20,000 ksi 138 GPa	1850°F 1010°C	45-60% IACS 2.9-3.8 μΩ-cm	0.319 lb/in ³ 8.83 g/cm ³	9.8×10 ⁻⁶ in/in °F 17.6×10 ⁻⁶ m/m °C	115 BTU/ft hr °F 200 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 lbs/in³ (8.75 g/cm³)

MECHANICAL PROPERTIES

Temper*	Heat Treatment Required	0.2% Offset Yield Strength		Ultimate Tensile Strength		Elongation***
		ksi	MPa	ksi	MPa	
	900 – 925 °F 480 – 495 °C					
A (TB00) H (TD04)	Before Heat Treatment	10-30 55-75	60-210 370-520	35-55 65-80	240-380 440-560	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 valid only for wire greater than 0.004" (0.10 mm) diameter.

FORMS AVAILABLE

Alloys 3 and 10 wire are supplied in loose coils or on spools or reels. They are available in diameters ranging from 0.050" to 0.5" (1.27 mm to 12.7 mm). Smaller diameter wire may be produced by a number of wire redrawers. Alloys 3 and 10 are also available in rod, bar, plate, tube, strip and parts finished by drawing, extrusion, and machining.

SPECIFICATIONS AND STANDARDS

C17500, EN 12165, EN 12166
C17510, EN 12167, EN 12166

RELATED INFORMATION

Additional technical or safe handling information on Alloy 3 or Alloy 10 wire may be obtained by phoning 800-375-4205. For pricing and availability, phone 800-323-2438, or the local sales number listed below.

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 B 250. 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.

SAFE HANDLING OF COPPER BERYLLIUM

Handling copper beryllium in solid form poses no special health risk. Like many industrial materials, beryllium-containing materials may pose a health risk if recommended safe handling practices are not followed. Inhalation of airborne beryllium may cause a serious lung disorder in susceptible individuals. The Occupational Safety and Health Administration (OSHA) has set mandatory limits on occupational respiratory exposures. Read and follow the guidance in the Safety Data Sheet (SDS) before working with this material. For additional information on safe handling practices or technical data on copper beryllium, contact Materion Performance Alloys, Technical Service Department at 1-800-375-4205.

North American Service Centers – Sales Inquiries

For strip ≤0.060" (1.5 mm) thick.
wire and rod ≤0.5" (12.7 mm) diameter:

Elmhurst, IL

TOLL FREE: 800-323-2438
PHONE: +(1) 630-832-9650
FAX: +(1) 630-832-9657

International Sales Offices

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