

Alloys 3 (C17510) and 10 (C17500) Wire

Materion Brush 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	9.8x10 ⁻⁶ in/in °F 17.6x10 ⁻⁶ m/m °C	140 BTU/ft hr °F 240 W/m K
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	9.8x10 ⁻⁶ in/in °F 17.6x10 ⁻⁶ m/m °C	115 BTU/ft hr °F 200 W/m K

*Properties specified for the precipitation age hardened (heat treated) condition

** Density in the un-heat treated condition 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)	3 hours	10-30	60-210	35-55	240-380	20-60
H (TD04)	2 hours	55-75	370-520	65-80	440-560	2-20
AT (TF00)	-	80-110	550-760	100-130	680-900	10 min.
HT (TH04)	-	95-125	650-870	110-140	750-970	10 min.

*Properties may vary by thickness. **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).

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

C17500, EN 12165, EN 12166

C17510, EN 12167, EN 12166

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
0.030	0.080	±0.0003	±0.001	0.8	1.5	±0.01	±0.03
0.0800	0.1250	±0.0004	±0.002	1.5	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	0.4060	±0.0010	±0.002				
0.4060	0.5000	±0.0010	±0.002				

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.

RELATED INFORMATION

Additional information on Alloys 3 and 10 wire may be obtained by phoning 800-375-4205, or one of the numbers below.

North American Service Centers – Sales Inquiries

For strip and small diameter rod and wire:
 Elmhurst, IL
 TOLL FREE: 800-323-2438
 LOCAL: +(1) 630-832-9650
 FAX: +(1) 630-832-9657

For Rod, bar, tube and plate:
 Warren, MI
 TOLL FREE: 800-521-8800
 LOCAL: +(1) 586-772-2700
 FAX: +(1) 586-772-2472

International Sales Offices

CHINA/HONG KONG

TEL: + (852) 2318-1960 / 1907
brushalloysHK-info@materion.com

CHINA/SHANGHAI

TEL: + (86) 21-5237-2328
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GERMANY

TEL: + (49) 711-830-930
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INDIA/PUNE

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