

Alloys 3 (C17510) and 10 (C17500) Tube

Alloys 3 and 10 tube from Materion Brush Performance Alloys provide high electrical and thermal conductivity coupled with moderate strength. Typical applications include electronic connectors, heat exchanger tubing, and resistance welding components.

CHEMICAL COMPOSITION (weight percent)

Alloy	Nickel	Cobalt	Beryllium	Copper
3 (C17500)	1.4 – 2.2	-	0.2 – 0.6	Balance
10 (C17500)	-	2.4 – 2.7	0.4 – 0.7	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 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	9.8×10 ⁻⁶ in/in °F 17.6×10 ⁻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) for both alloys

MECHANICAL PROPERTIES*

Temper	Heat Treatment Required	Outside Diameter		0.2% Offset Yield Strength		Ultimate Tensile Strength		Elongation Percent
		in	mm	ksi	MPa	ksi	MPa	
A (TB00)	850 - 900°F 450 - 480°C 3 hours	0.75 - 16	19.1 - 406	10-30	70-210	35-55	240-380	20-35
H (TD04)	2 hours	0.375 - 3	19.1 - 76	50-75	350-520	65-80	450-550	10-15
AT (TF00)	-	0.75 - 16	19.1 - 406	80-100	550-690	100-130	690-900	10-25
HT (TH04)	-	0.375 - 3	19.1 - 76	95-125	660-860	110-140	760-970	5-25

*Properties may vary by tube wall thickness.

FORMS AVAILABLE

Alloys 3 and 10 tube are available with outside diameters ranging from 0.75" to 16" (19.1 mm to 406 mm) for Annealed (A) temper. Hard (H) temper is available in 0.375" to 3" (3.8 mm to 76 mm) outside diameters. Wall thickness is typically 10 to 20% of the outside diameter, subject to certain maximum and minimum constraints. Smaller diameter tube may be produced by tube redrawers. Alloys 3 and 10 are also available in rod, bar, wire, plate and parts finished by drawing, extrusion, and machining. Alloy 3 is also available in strip.

SPECIFICATIONS

C17500, ASTM B-937, EN 12163, EN 12165, EN 12167, SAE J 461, SAE J 463, RWMA Class 3
 C17510, ASTM B-937, EN 12163, EN 12165, EN 12167, SAE J 461, SAE J 463, RWMA Class 3

TOLERANCES

Outside Diameter (inches)		Standard Diameter Tolerance (inches)		Outside Diameter (mm)		Standard Diameter Tolerance (mm)	
Over	Including	Cold Drawn Tube	Hotworked Tube	Over	Including	Cold Drawn Tube	Hotworked Tube
0.375	0.500	±0.002		3.8	12	±0.05	
0.500	1.00	±0.003		12	25	±0.08	
1.00	2.00	±0.004		25	50	±0.10	
2.00	3.00	±0.02% of OD		50	75	±0.02% of OD	
0.750	1.25		±0.020	20	30		±0.50
1.25	2.50		±0.030	30	38		±0.75
2.50	6.00		±0.060	38	150		±1.50

Additional tolerances are per ASTM B 937. 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 tube 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
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To obtain a complete list of our global Distributor/Agent network, visit us online at www.materion.com/BrushAlloys/ContactUs.