

Alloys 3 (C17510) and 10 (C17500) Rod and Bar

Alloys 3 and 10 rod and bar from Materion Brush Performance Alloys provide high electrical and thermal conductivity coupled with moderate strength. Typical applications include 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	9.8x10 ⁻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) for both alloys

MECHANICAL PROPERTIES*

Temper*	Outer Diameter (Rod) or Thickness (Bar)		Heat Treatment Required	0.2% Offset Yield Strength		Ultimate Tensile Strength		Elongation Percent
	inch	mm		ksi	MPa	ksi	MPa	
A (TB00)	0.030-10	0.76-254	850 – 900°F 450 – 480°C 3 hours	10-30	70-210	35-55	240-380	20-35
H (TD04)	0.030-3	0.76-76	2 hours	50-75	350-520	65-80	450-550	10-15
AT (TF00)	0.030-10	0.76-254	-	80-100	550-690	100-130	690-900	10-25
HT (TH04)	0.030-3	0.76-76	-	95-125	660-860	110-140	760-970	5-25

*Properties may vary by diameter (rod) or thickness (bar)

**Rod and Bar typically provided in an annealed or cold drawn temper and heat treated after machining. Only rod or bar greater than 0.4375" (12.0) diameter or thickness may also be purchased in the pre-heat treated condition.

FORMS AVAILABLE

Alloys 3 and 10 rod and bar are supplied in straight lengths up to 30 ft (9.1 m). Solution Annealed rod and bar are available in diameters/ thicknesses ranging from 0.030" to 10" (0.76 mm to 254 mm) and hard drawn tempers are available in 0.030" to 3" (0.76 mm to 76 mm). Alloys 3 and 10 are also available in tube, wire, plate and parts finished by drawing, extrusion, and machining. Alloy 3 is also available in strip.

SPECIFICATIONS

Alloy 3 - C17510, ASTM B-441, SAE J 461, SAE J 463, RWMA Class 3

Alloy 10 - C17500, ASTM B-441, SAE J 461, SAE J 463, RWMA Class 3

TOLERANCES

	Rod Diameter or Bar Thickness (inches)		Standard Tolerance (inches)		Rod Diameter or Bar Thickness (mm)		Standard Tolerance (mm)	
	Over	Including	Diameter or Thickness	Out of Round	Over	Including	Diameter or Thickness	Out of Round
Cold Drawn	0.0300	0.0800	±0.0003	0.0003	0.76	2.0	±0.008	0.008
	0.0800	0.1250	±0.0004	0.0004	2.0	3.2	±0.010	0.010
	0.1250	0.2500	±0.0006	0.0004	3.2	6.4	±0.015	0.010
	0.2500	0.3125	±0.0007	0.0007	6.4	7.9	±0.018	0.018
	0.3125	0.3750	±0.001	0.001	7.9	9.5	±0.025	0.025
	0.3750	0.500	±0.002		9.5	12.0	±0.05	
	0.500	1.00	±0.003		12.0	25.0	±0.08	
	1.00	2.00	±0.004		25.0	50.0	±0.10	
	2.00	3.00	±0.2% of Size		50.0	75.0	±0.2% of Size	
Hot Worked	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 441. 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 rod and bar 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
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