

Alloy 25 (C17200) Rod and Bar

Alloy 25 rod and bar from Materion Brush Performance Alloys provide the highest strength of any copper alloy, with electrical and thermal conductivity considerably greater than other high strength copper alloys. This alloy features high fatigue strength and resistance to wear, corrosion, galling, and stress relaxation. Typical applications include downhole drilling flex shafts, bushings and bearings, circular and coaxial connectors, test probes and compression contacts, and resistance welding components.

CHEMICAL COMPOSITION (weight percent)

Alloy	Beryllium	Nickel + Cobalt	Nickel + Cobalt + Iron	Copper
C17200	1.80 – 2.00	0.20 min.	0.6 max.	Balance

PHYSICAL PROPERTIES*

Elastic Modulus	Melting Point (Solidus)	Electrical Conductivity/ Resistivity	Density**	Thermal Expansion Coefficient	Thermal Conductivity (25 °C)
19,000 ksi 131 GPa	1600°F 870°C	25-30% IACS 5.8-6.9 μΩ-cm	0.302 lb/in ³ 8.36 g/cm ³	9.7×10 ⁻⁶ in/in °F 17.0×10 ⁻⁶ m/m °C	60 BTU/ft hr °F 105 W/m K

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

** Density in the un-heat treated condition is 0.300 lbs/in³ (8.30 g/cm³)

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)	0.030-14	0.76-356	600 – 675 °F 315 – 357 °C 3 hours	20-35	130-250	60-85	410-590	20-75
H (TD04)	0.030-0.375	0.76-9.5	2-3 hours	75-105	520-720	90-130	620-900	8-30
H (TD04)	>0.375-1	>9.5-25.4	2-3 hours	75-105	520-720	90-125	620-860	8-30
H (TD04)	>1-3	>25.4-76	2-3 hours	75-105	520-720	85-120	590-830	8-20
AT (TF00)	0.030-3	0.76-76	-	145-175	1000-1210	165-200	1140-1380	4-10
AT (TF00)	>3-14	>76-356	-	130-175	1000-1210	165-200	1140-1380	3-10
HT (TH04)	0.030-0.375	0.76-9.5	-	160-200	1000-1380	185-225	1280-1550	2-9
HT (TH04)	>0.375-1	>9.5-25.4	-	155-195	1070-1340	180-220	1240-1520	2-9
HT (TH04)	>1-3	>25.4-76	-	145-190	1000-1310	175-215	1210-1480	4-9

*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

Alloy 25 rod and bar are supplied in straight lengths up to 30 ft (9.1m). Solution annealed tempers are available in diameters/thicknesses ranging from 0.030" to 14" (0.76 mm to 356 mm) and hard drawn tempers are available in 0.030" to 3" (0.76 mm to 76 mm). Alloy 25 is also available in strip, wire, plate, tube and parts finished by drawing, extrusion, and machining.

SPECIFICATIONS

C17200, ASTM B-196, AMS 4533, AMS 4534, AMS 4650, AMS 4651, SAE J 461, SAE J 463, JIS H3270, EN 1654, EN 12163, EN 12165, EN 12167, GB5233, GB4431, RWMA Class 4, BMS 7-353 Type 2, MIL-C-21657

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 196. 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 Alloy 25 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

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