



## Alloy 25 (C17200) Tube

Alloy 25 Tube from Materion Performance Alloys provides the highest strength of any copper alloy, with electrical conductivity considerably greater than other high strength copper alloys. This alloy features high fatigue strength and magnetic permeability approaching unity. Typical applications include bushings and bearings for aircraft as well as drill collars and instrument housings for oil and gas exploration.

### 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)	Relative Magnetic Permeability
19,000 ksi 131 GPa	1600°F 870°C	25-30% IACS 5.8-6.9 μΩ-cm	0.302 lb/in <sup>3</sup> 8.36 g/cm <sup>3</sup>	9.7x10 <sup>-6</sup> in/in °F 17.5x10 <sup>-6</sup> m/m °C	60 BTU/ft hr °F 105 W/m °C	<1.0006

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

\*\*Value listed is the density after heat treatment. The density before heat treatment is 0.300 lbs/in<sup>3</sup> (8.30 g/cm<sup>3</sup>)

### MECHANICAL PROPERTIES\*

Temper	Heat Treatment Required	Outside Diameter		0.2% Offset Yield Strength		Ultimate Tensile Strength		Elongation
		in	mm	ksi	MPa	ksi	MPa	Percent
A (TB00)	Before Heat Treatment	0.75 - 16	19.1 - 406	20-35	130-250	60-85	410-590	20-75
H (TD04)		≤ 0.375	≤ 9.5	75-105	520-720	90-130	620-900	8-30
H (TD04)		>0.375 - 1	>9.5 - 25.4	75-105	520-720	90-125	620-860	8-30
H (TD04)	>1 - 3.75	> 25.4 - 76	75-105	520-720	85-120	590-830	8-20	
AT (TF00)	After 3 - 4 hours	0.75 - 3	19.1 - 76	145-175	1000-1210	165-200	1140-1380	4-10
AT (TF00)		> 3 - 16	> 76 - 406	130-175	900-1210	165-200	1140-1380	3-10
HT (TH04)	After 2-3 hours	≤ 0.375	≤ 9.5	160-200	1100-1380	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 - 3.75	> 25.4 - 76	145-190	1000-1310	175-215	1210-1480	4-9
DST	-	1 - 7	25 - 180	110 min.	760 min.	140 min.	970 min.	12 min.
DST	-	> 7 - 11	>180 - 280	100 min.	690 min.	135 min.	930 min.	13 min.
DST	-	> 11	> 280	90 min.	620 min.	120 min.	830 min.	13 min.

\*Properties may vary by tube wall thickness.

### FORMS AVAILABLE

Alloy 25 tube is 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” (9.5 mm to 76 mm) outside diameters. Wall thickness is typically 10 to 20% of the outside diameter, subject to certain maximum and minimum constraints. For extruded tube, OD/Wall thickness Smaller diameter tube may be produced by tube redrawers. Alloy 25 is also available in strip, rod, bar, plate, wire and parts finished by drawing, extrusion, and machining.

**SPECIFICATIONS AND STANDARDS** CI 7200, ASTM B643, ASTM B251, AMS 4535, SAE J 461, SAE J 463, JIS H3270, EN 1654, EN 12163, EN 12165, EN 12167, GB5233, GB4431, BMS 7-353 Type 2, MIL-C-21657

**TOLERANCES**

	Outside Diameter (in)		Standard Diameter Tolerance (in)	Outside Diameter (mm)		Standard Diameter Tolerance (mm)
	Over	Including		Over	Including	
<b>Cold Worked</b>	0.375	0.625	±0.003	9.5	15.9	±0.08
	0.625	0.75	±0.006	15.9	19.1	±0.15
	0.75	1.00	±0.006	19.1	25.4	±0.15
	1.00	2.00	±0.008	25.4	50.8	±0.20
	2.00	3.00	±0.010	50.8	76.2	±0.25
	3.00	3.75	±0.012	76.2	95.3	±0.30
<b>Extruded</b>	0.75	1.25	±0.020	19.1	31.8	±0.51
	1.25	2.00	±0.030	31.8	50.8	±0.76
	2.00	3.00	±0.040	50.8	76.2	±1.02
	3.00	4.00	±0.050	76.2	102	±1.27
	4.00	6.00	±0.060	102	152	±1.52
	6.00	8.00	±0.100	152	203	±2.54
	8.00	16.0	±0.125	203	406	±3.18

Additional tolerances are per ASTM B643. 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 technical or safe handling information on Alloy 25 tube may be obtained by phoning 800-375-4205. For pricing and availability, phone 800-521-8800, or the local sales number listed on the bottom of this page.

**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 bar, tube, plate/sheet >0.060" (1.5 mm) thick and rod >0.5" (12.7 mm) diameter:

### **Warren, MI**

TOLL FREE: 800-521-8800  
PHONE: +(1) 586-772-2700  
FAX: +(1) 586-772-2472

## International Sales Offices

### **CHINA/HONG KONG**

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### **CHINA/SHANGHAI**

TEL: + (86) 21-5237-2328  
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