

## Alloy M25 (C17300) Wire

**Alloy M25** from Materion Performance Alloys is a free machining, high performance copper alloy. **M25's** properties minimize signal distortion in coaxial RF connectors and reduce power loss in circular connectors and contact probes. **M25** is available in spooled or coiled wire product forms, and in different tempers to accommodate diverse design requirements. After machining and forming operations, **M25** parts can be easily heat treated and plated to obtain maximum mechanical and electrical performance. Applications requiring stability to 175° C or reliable contact force in miniaturized designs specify Alloy **M25**. In demanding electronic applications, **M25** provides performance and reliability superior to any free machining copper alloy.

### CHEMICAL COMPOSITION (weight percent)

Alloy	Beryllium	Nickel + Cobalt	Nickel + Cobalt + Iron	Lead	Copper
C17300	1.80 – 2.00	0.20 min.	0.6 max.	0.20 – 0.60	Balance

### PHYSICAL PROPERTIES\*

Elastic Modulus	Melting Point (Solidus)	Electrical Conductivity/ Resistivity	Density**	Thermal Expansion Coefficient	Thermal Conductivity (25 °C)	Machinability Index
19,000 ksi 131 GPa	1600°F 870°C	22-28% IACS 6.2-7.8 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 K	60% (vs. free-cutting brass)

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

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

### MECHANICAL PROPERTIES\*

Temper*	Heat Treatment**	0.2% Offset Yield Strength		Ultimate Tensile Strength		Elongation Percent
		ksi	MPa	ksi	MPa	
	<b>600 – 625 °F 315 – 330 °C</b>					
A (TB00)	Before Heat Treatment	20-30	130-210	60-82	410-565	30-75
¼ H (TD01)		75-105	510-730	90-115	620-800	2-25
½ H (TD02)		90-125	620-870	110-135	750-940	2-15
¾ H (TD03)		115-150	790-1040	130-155	890-1070	2-8
H (TD04)		130-160	890-1110	140-165	960-1140	1-8
AT (TF00)	After 3 hours	145-180	990-1250	160-200	1100-1380	3 min.
¼ HT (TH01)	After 2 hours	165-200	1130-1380	175-210	1200-1450	2 min.
½ HT (TH02)	After 1.5 hours	170-210	1170-1450	185-215	1270-1490	2 min.
¾ HT (TH03)	After 1 hour	175-220	1200-1520	190-230	1310-1590	2 min.
HT (TH04)	After 1 hour	180-220	1240-1520	195-230	1340-1590	1 min.

\*Properties may vary by diameter. \*\*Wire is typically provided in an annealed or cold drawn temper and heat treated after forming. Wire may also be provided pretempered (heat treated).

### FORMS AVAILABLE

Alloy M25 wire is supplied in loose coils or on spools or reels. It is available in diameters ranging from 0.030" to 0.5" (0.76 mm to 12.7 mm) for A, ¼ H, and ½ H tempers. ¾ H, and H tempers are available in 0.030" to 0.080" (0.76 mm to 2.0 mm) diameters. Smaller diameter wire may be produced by wire redrawers. Alloy M25 is also available in rod.

### SPECIFICATIONS AND STANDARDS

C17300, ASTM B-197, EN 12165, 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	2.0	±0.008	±0.030
0.0800	0.1250	±0.0004	±0.002	2.0	3.2	±0.010	±0.050
0.1250	0.2500	±0.0006	±0.002	3.2	6.4	±0.015	±0.050
0.2500	0.3125	±0.0007	±0.002	6.4	8.0	±0.020	±0.050
0.3125	0.5000	±0.0010	±0.002	8.0	12.0	±0.030	±0.050

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 technical or safe handling information on Alloy M25 may be obtained by phoning 800-375-4205 or your local international sales office (listed below). For pricing and availability, please contact your local service center or sales office.

## 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 strip ≤0.060" (1.5 mm) thick and wire and rod ≤0.5" (12.7 mm) diameter:

**Elmhurst, IL**  
TOLL FREE: 800-323-2438  
PHONE: +(1) 630-832-9650  
FAX: +(1) 630-832-9657

## International Sales Offices

### CHINA/HONG KONG

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### CHINA/SHANGHAI

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