

Alloys 3 (C17510) and 10 (C17500) Plate

Alloys 3 and 10 plate from Materion Performance Alloys provide high electrical and thermal conductivity coupled with moderate strength. Typical applications include resistance welding components, and inserts for metal die casting, injection molding and blow molding.



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

**Value listed is the density after heat treatment. The density before heat treatment is 0.316 lbs/in³ (8.75 g/cm³)

MECHANICAL PROPERTIES*

Temper**	Plate Thickness		Heat Treatment Required	0.2% Offset Yield Strength		Ultimate Tensile Strength		Elongation
	inch	mm		ksi	MPa	ksi	MPa	
A (TB00)	1.75-5	44.5-127	Before Heat Treatment	25-45	170-310	35-55	240-380	20-35
H (TD04)	0.188-3	4.8-76		55-80	380-550	70-85	480-590	2-8
AT (TF00)	1.75-5	44.5-127	After 3 hours	80-100	550-690	100-130	690-900	8-20
HT (TH04)	0.188-3	4.8-76	After 2 hours	100-120	690-830	110-140	760-970	5-15

*Properties may vary by thickness

FORMS AVAILABLE

Alloy 3 and Alloy 10 plate are supplied in lengths from 24 to 126 inches (610 to 3200 mm), and in widths from 12 to 22 inches (305 to 559 mm). Solution annealed tempers are available in thicknesses ranging from 1.75" to 5" (44.5 to 127.0 mm) and hard drawn tempers are available from 0.188" to 3" (4.8 mm to 76 mm). Alloys 3 and 10 are also available in tube, wire, rod, bar and parts finished by drawing, extrusion, and machining. Alloy 3 is also available in strip.

SPECIFICATIONS AND STANDARDS

Alloy 3 - C17510, ASTM B-534, SAE J 461, SAE J 463

Alloy 10 - C17500, ASTM B-534, SAE J 461, SAE J 463

TOLERANCES

Plate Thickness (inches)		Standard Thickness Tolerance (inches)		Plate Thickness (mm)		Standard Thickness Tolerance (mm)	
Over	Including	Plus	minus	Over	Including	Plus	Minus
0.188	0.205	0.020	0	4.8	5.2	0.50	0
0.205	0.300	0.024	0	5.2	8.0	0.60	0
0.300	0.500	0.030	0	8.0	13	0.80	0
0.500	0.750	0.038	0	13	20	1.00	0
0.750	1.00	0.046	0	20	25	1.20	0
1.00	1.50	0.056	0	25	40	1.40	0
1.50	3.00	0.066	0	40	76	1.70	0
3.00	5.00	0.125	0	76	127	3.20	0

Additional tolerances are per ASTM B 534. 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 3 or Alloy 10 Plate may be obtained by phoning 800-375-4205. For pricing and availability, phone 800-521-8800, or the local sales number listed below.

HEALTH & SAFETY

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 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
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International Sales Offices

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