

## Alloys 3 (C17510) and 10 (C17500) Plate

Alloys 3 and 10 plate from Materion 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 (C17510)	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 <sup>3</sup> 8.83 g/cm <sup>3</sup>	9.8 x 10 <sup>-6</sup> in/in °F 17.6 x 10 <sup>-6</sup> m/m °C	140 BTU/ft hr °F 240 W/m °C
10	20,000 ksi 138 GPa	1850 °F 1010 °C	45 - 60% IACS 2.9 - 3.8 μΩ-cm	0.319 lb/in <sup>3</sup> 8.83 g/cm <sup>3</sup>	9.8 x 10 <sup>-6</sup> in/in °F 17.6 x 10 <sup>-6</sup> m/m °C	115 BTU/ft hr °F 200 W/m °C

\*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 lb/in<sup>3</sup> (8.75 g/cm<sup>3</sup>).

### 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" (610 to 3200 mm) and in widths from 12" to 22" (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 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.

## Industry Standards and Specifications

Alloy 3: C17510, ASTM B534, SAE J461, SAE J463

Alloy 10: C17500, ASTM B534, SAE J461, SAE J463

## 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 +1.800.375.4205. For pricing and availability, phone +1.800.521.8800.

## Health and Safety

Processing beryllium-containing alloys poses a health risk if safe practices are not followed. Inhalation of airborne beryllium can cause serious lung diseases in some individuals. Occupational safety and health regulatory agencies worldwide have set mandatory limits on occupational respiratory exposures. Read and follow the guidance in the Safety Data Sheet (SDS) before working with this material. The SDS and additional important beryllium health and safety information and guidance can be found at [berylliumsafety.com](http://berylliumsafety.com), [berylliumsafety.eu](http://berylliumsafety.eu) and [Materion.com](http://Materion.com). For questions on safe practices for beryllium-containing alloys, contact the Materion Product Stewardship Group at +1.800.862.4118 or contact us by email at [Materion-PS@Materion.com](mailto:Materion-PS@Materion.com).

### Disclaimer:

Only the buyer can determine the appropriateness of any processing practice, end-product or application. Materion does not make any warranty regarding its recommendations, the suitability of Materion's product, or its processing suggestions for buyer's end product, application or equipment.

The properties presented on this data sheet are for reference purposes only, intended only to initiate the material selection process. They do not constitute, nor are they intended to constitute, a material specification. Material will be produced to one of the applicable industry standards, if any, listed in the Industry Standards and Specification section.

Actual properties may vary by thickness and/or part number. Please contact your local sales engineer for detailed properties to be used in simulation.

Any properties marked as preliminary are subject to change at any time as the manufacturing process is further refined.