MATERION

Data Sheet

Alloys 3 (C17510) and 10 (C17500) Forgings and Extrusions

Alloys 3 and 10 from Materion provide high electrical and thermal conductivity coupled with moderate strength. Typical applications for parts finished by forging or extrusion of these alloys include continuous casting mold components and resistance welding components.

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

Typical 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	9.8 x 10^{-6} in/in °F 17.6 x 10^{-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	9.8 x 10^{-6} in/in °F 17.6 x 10^{-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 lb/in^3 (8.75 g/cm^3) for both alloys.

Typical Mechanical Properties*

Temper	Heat Treatment Required	0.2% Offset Yield Strength		Ultimate Tensile Strength		Elongation	Hardness
	900 °F 480 °C	ksi	MPa	ksi	MPa	Percent	HRB
A (TB00)	Before Heat Treatment	10 - 30	60 - 210	35 - 55	240 - 380	20 - 35	B20 - B50
AT (TF00)	After 3 hours	80 - 110	550 - 760	100 - 130	690 - 900	10 min.	B92 - 100

*Properties may vary by size.

Forms Available

Please contact Materion Customer Technical Service department at +1.216.486.4200 for more information or to discuss your requirements.

Industry Standards and Specifications

Alloy 3 - C17510, ASTM B870
Alloy 10 - C17500, ASTM B870

Related Information

Additional technical or safe handling information on parts made by forging or extrusion from Alloy 3 or Alloy 10 may be obtained by calling +1.800.375.4205.

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, berylliumsafety.eu and 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.

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