

Brush Alloy 310

Materion's Brush Alloy 310 is a low cost copper-beryllium-nickel-cobalt alloy with high electrical and thermal conductivity possessing excellent strength and hardness. The alloy has been shown to have outstanding thermal fatigue resistance. Typical applications include resistance welding electrodes and other welding electrode components. The material is also utilized for non-ferrous metal casting dies, plungers, and nozzles.

Chemical Composition (Weight Percent)

Alloy	Nickel	Cobalt	Beryllium	Copper
310	0.8 - 1.3	0.8 - 1.3	0.4 - 0.7	Balance

Typical Physical Properties

Elastic Modulus	Melting Point (Liquidus)	Melting Point (Solidus)	Electrical Conductivity	Density	Thermal Expansion Coefficient (20 to 200 °C)	Thermal Conductivity (25°C)
19,600 ksi 135 kN/mm ²	1975°F 1080°C	1880°F 1030°C	45% IACS 3.8 μ-ohm-cm	0.318 lb/in ³ 8.81 g/cm ³	9.8 x 10 ⁻⁶ in/in °F 17.6 x 10 ⁻⁶ m/m °C	135 BTU/hr-ft-°F 235 W/m-°C

Typical Mechanical Properties

Temper	0.2% Offset Yield Strength (nominal)		Ultimate Tensile Strength (nominal)		Elongation (nominal)	Hardness
	ksi	N/mm ²	ksi	N/mm ²	%	BNH (HRB)
AT or HT* (TF00 or TH04)	96 - 107	660 - 740	104 - 119	720 - 820	10 - 14	230 min (98 min)

*Dependent upon size/shape required.

Forms Available

Rounds, square and rectangular bars, forged plates, cast rounds, and parts finished machined per customer drawings.

Industry Standards & Specifications

None

Related Information

Additional technical information on Alloy 310 can be obtained by calling +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, 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 by email at 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.

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