Brush Alloy 310

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

CHEMICAL COMPOSITION (WEIGHT PERCENT)

<table>
<thead>
<tr>
<th>Alloy</th>
<th>Nickel</th>
<th>Cobalt</th>
<th>Beryllium</th>
<th>Copper</th>
</tr>
</thead>
<tbody>
<tr>
<td>310</td>
<td>0.8 - 1.3</td>
<td>0.8 - 1.3</td>
<td>0.4 - 0.7</td>
<td>Balance</td>
</tr>
</tbody>
</table>

PHYSICAL PROPERTIES

<table>
<thead>
<tr>
<th>Elastic Modulus</th>
<th>Melting Point (Liquidus)</th>
<th>Melting Point (Solidus)</th>
<th>Electrical Conductivity</th>
<th>Density</th>
<th>Thermal Conductivity (25°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>19,600 ksi</td>
<td>1975°F</td>
<td>1880°F</td>
<td>45% IACS (nominal)</td>
<td>0.318 lb/in³</td>
<td>135 BTU/hr-ft.°F</td>
</tr>
<tr>
<td>135 kN/mm²</td>
<td>1080°C</td>
<td>1030°C</td>
<td>3.8 μ-ohm-cm (nominal)</td>
<td>8.81 g/cm³</td>
<td>235 W/m·°C</td>
</tr>
</tbody>
</table>

TYPICAL MECHANICAL PROPERTIES

<table>
<thead>
<tr>
<th>Temper</th>
<th>0.2% Offset Yield Strength (nominal)</th>
<th>Ultimate Tensile Strength (nominal)</th>
<th>Elongation (nominal)</th>
<th>Hardness</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT or HT*</td>
<td>ksi</td>
<td>N/mm²</td>
<td>ksi</td>
<td>N/mm²</td>
</tr>
<tr>
<td>(TF00 or TH04)</td>
<td>96 - 107</td>
<td>660 - 740</td>
<td>104 - 119</td>
<td>720 - 820</td>
</tr>
</tbody>
</table>

*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 800-375-4205. For pricing and availability, phone 800-521-8800, or the local sales number listed on the reverse side of this page.
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 e-mail 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.