Alloy 25 (C17200)

Technical Datasheet

High Strength Copper Beryllium Alloy

Typical Applications
Aerospace, Heavy duty bearings and bushings, Oil and gas exploration, Automotive, Marine, Chemical processing, Welding

Product Description
Alloy 25 is a high performance copper beryllium alloy used in applications requiring strength, fatigue resistance, non-magnetic properties, conductivity, and corrosion resistance. Alloy 25, supplied with certified mechanical properties, is fully heat treated and no additional treatment is required. Alloy 25 magnetic properties are unaffected by machining and surface abrasion.

Galling & Wear Resistance
Alloy 25 provides excellent galling resistance to itself and other alloys at high load conditions. Galling resistance, high hardness and low friction provide wear resistance in bearing and bushing applications under conditions of marginal lubrication.

Material Specifications
- UNS C17200
- ASTM B196
- AMS 4533, 4534, 4535
- QQ-C-530
- RWMA – Class 4
- API Spec 7
- BS EN 12163

Fabrication
- Machining – very good
- Brazing – good
- Electro-discharge machining – good
- Welding – good/fair

Corrosion Resistance
Alloy 25’s corrosion resistance is similar to pure copper. It resists corrosion in sea water, most organic solutions, non-oxidizing acids, and dilute alkalis. Alloy 25 is not subject to hydrogen embrittlement, and it resists stress corrosion cracking in sulfide and chloride solutions. It meets the requirements of NACE MR0175. Alloy 25 is not recommended for use with ammonium hydroxide or strongly oxidizing acids.

Availability
Bar, rod, plate, wire, tube, extrusions, forgings

Chemical Composition (weight %)

<table>
<thead>
<tr>
<th>Weight (%)</th>
<th>Be</th>
<th>Co+Ni</th>
<th>Fe</th>
<th>Cu</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>1.8</td>
<td>0.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td>2.0</td>
<td>0.50</td>
<td>0.1</td>
<td>Balance</td>
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</tbody>
</table>

Mechanical Properties

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Alloy 25 AT</th>
<th>Alloy 25 HT</th>
</tr>
</thead>
<tbody>
<tr>
<td>UTS, MPa</td>
<td>1130-1380</td>
<td>1200-1520</td>
</tr>
<tr>
<td>0.2% PS, MPa</td>
<td>890-1210</td>
<td>1030-1380</td>
</tr>
<tr>
<td>Elongation, % in 4D</td>
<td>3-10</td>
<td>2-9</td>
</tr>
<tr>
<td>Hardness, HRC</td>
<td>36-41</td>
<td>37-45</td>
</tr>
<tr>
<td>Fatigue strength at 10⁸, MPa</td>
<td>340-450</td>
<td>340-450</td>
</tr>
<tr>
<td>Elastic modulus, GPa</td>
<td>131</td>
<td>131</td>
</tr>
<tr>
<td>Thermal conductivity, W/m °C</td>
<td>105</td>
<td>105</td>
</tr>
<tr>
<td>Thermal expansion, ppm/°C</td>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td>Magnetic permeability</td>
<td>&lt;1.001</td>
<td>&lt;1.001</td>
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<tr>
<td>Density, g/cm³</td>
<td>8.36</td>
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</table>

High Temperature Strength

<table>
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<tr>
<th>Temperature, °C</th>
<th>150</th>
<th>200</th>
<th>250</th>
<th>300</th>
<th>350</th>
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</thead>
<tbody>
<tr>
<td>UTS, MPa</td>
<td>1210</td>
<td>1210</td>
<td>1180</td>
<td>1030</td>
<td>650</td>
</tr>
</tbody>
</table>

Technical Assistance
Our knowledgeable staff backed up by our resident team of qualified metallurgists and engineers, will be pleased to assist further on any technical topic.

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