Beryllium Copper Alloy

Alloy 25 (C17200) is a high strength Beryllium Copper Alloy

Utilised in applications requiring good strength and fatigue resistance, Alloy 25 (C17200) is a beryllium-copper alloy which offers a broad range of attractive performance characteristics. Benefits include good conductivity and corrosion resistance. This high-performance material is non-magnetic, and these qualities are unaffected by machining and surface abrasion. Once fully heat-treated, no additional treatments are required.

Galling and Wear Resistance

The galling resistance of the alloy under high load conditions is excellent. The combination of galling resistance, high hardness and low friction results in excellent wear resistance in components such as bearings and bushes under conditions where lubrication is marginal.

Corrosion Resistance

The corrosion resistance of the product is similar to pure copper; this includes resistance to saltwater environments, non-oxidising acids, dilute alkalis and most organic solutions. The material is stress corrosion resistant in chloride and sulphide solutions and is not subject to hydrogen embrittlement.

The product offers the highest strength of any copper alloy combined with electrical conductivity, which is considerably improved when compared to other high strength copper alloys.

Machinability, brazing and electro-discharge machining are all rated as good. Weldability of the alloy is considered to be good to fair.

Availability

Bar, plate, and wire

About Smiths High Performance

Smiths High Performance is a leading stockholder and supplier of high-performance engineering materials to the global motorsport sector. We are supply partners in a range of specialist motorsport markets including Formula 1, Formula E, NASCAR, MOTO GP, WEC & WRC.

Further technical data available on the reverse of this Datasheet
Alloy 25 (C17200)

When you purchase high-performance materials from Smiths High Performance, you will be joining some of the biggest and best global engineering companies. We are a Tier 1 supply chain partner to the world’s leading motorsport companies. Our unique business structure and ethos allows us to offer services which are otherwise unavailable in this market sector.

Chemical Composition

<table>
<thead>
<tr>
<th>Weight (%)</th>
<th>Be</th>
<th>Co + Ni</th>
<th>Fe</th>
<th>Cu</th>
</tr>
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<tbody>
<tr>
<td>Min</td>
<td>1.8</td>
<td>0.20</td>
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<tr>
<td>Max</td>
<td>2.0</td>
<td>0.50</td>
<td>0.1</td>
<td>Bal</td>
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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>
</tr>
</thead>
<tbody>
<tr>
<td>UTS, MPa</td>
<td></td>
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<tr>
<td>1130-1380</td>
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<tr>
<td>1200-1520</td>
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</table>

Mechanical Properties

- UTS, MPa
- 0.2% PS, MPa
- Elongation, % in 4D
- Hardness, HRC
- Fatigue strength at 10⁶, MPa
- Elastic modulus, GPa
- Thermal conductivity, W/m °C
- Thermal expansion, ppm/°C
- Magnetic permeability
- Density, g/cm³

Alloy 25 is often used to make seat inserts for titanium valves used in racing engines. The high copper content provides a combination of superior strength with impressive heat transfer qualities. The combination helps to promote the life expectancy of the intake valve while affording the strength to withstand forces during operation.

Use in Intake Valves

- Seat inserts for titanium valves
- Bearings and bushes
- Electronic components
- Valve pins
- Electromagnetic shielding gaskets
- Fasteners

Motorsport Applications

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