Alloy K-500
Technical Datasheet

Precipitation Hardenable Nickel-Copper Alloy

Typical Applications

• Pump shafts
• Oil well tools and instruments
• Springs
• Valve trim
• Fasteners/bolting
• Marine propeller shafts
• Electronic components
• Cryogenic equipment

Product Description

Alloy K-500 is a precipitation/age hardenable nickel-copper alloy providing high mechanical strength combined with excellent corrosion resistance. Tensile strength is typically twice and yield strength three times that of alloy 400 nickel-copper. The alloy exhibits outstanding properties at sub-zero (including cryogenic) temperatures at which ductility and toughness are virtually unimpaired. It also possesses low permeability and is non-magnetic to temperatures as low as minus 101°C.

Material Specifications

• UNS N05500
• BS 3072 (NA18)
• ASTM B865
• AMS 4676
• 2.4375
• NACE MR01-75 / ISO 15156

Corrosion Resistance

Alloy K-500 provides excellent resistance to corrosion in seawater, oil & gas environments and a wide variety of industrial media. The corrosion resistance of alloy K-500 is substantially equivalent to that of alloy 400 (non-hardenable nickel-copper alloy) except that, when in the age-hardened condition, alloy K-500 has a greater tendency toward stress corrosion cracking in some media.

Fabrication

Heavy machining of alloy K-500 is best achieved when the material is in the annealed or hot-worked and quenched condition. It is common practise to machine slightly oversize, age-harden, then finish to size. However, age-hardened material can be finish machined to close tolerances and fine finishes. The alloy can be joined by industry-standard welding, brazing and soft soldering processes.

Availability

Bar, wire, pipe, tube, sheet, plate, strip.

Chemical Composition (weight %)

<table>
<thead>
<tr>
<th>Weight (%)</th>
<th>C</th>
<th>S</th>
<th>Si</th>
<th>Mn</th>
<th>Cu</th>
<th>Fe</th>
<th>Al</th>
<th>Ti</th>
<th>Ni+Co</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>0.25</td>
<td>0.01</td>
<td>0.5</td>
<td>1.5</td>
<td>33.0</td>
<td>2.0</td>
<td>3.15</td>
<td>0.85</td>
<td>63.0</td>
</tr>
<tr>
<td>Max</td>
<td>0.25</td>
<td>0.01</td>
<td>0.5</td>
<td>1.5</td>
<td>33.0</td>
<td>2.0</td>
<td>3.15</td>
<td>0.85</td>
<td>63.0</td>
</tr>
</tbody>
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Mechanical Properties (Precipitation Hardened)

<table>
<thead>
<tr>
<th>UTS, MPa</th>
<th>0.2% PS, MPa</th>
<th>Elongation %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1100 min</td>
<td>790 min</td>
<td>20 min</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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