High-Performance Alloys
SB01

Material Designation

<table>
<thead>
<tr>
<th>DIN-EN Symbol</th>
<th>CuFe0,1P</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIN-EN</td>
<td>-</td>
</tr>
<tr>
<td>UNS</td>
<td>C19210</td>
</tr>
<tr>
<td>JIS</td>
<td>C1921</td>
</tr>
<tr>
<td>The Miller Company</td>
<td>-</td>
</tr>
</tbody>
</table>

Nominal Composition (mass content in %)

| Element | Cu       | Balance | Fe   | 0.1 | P    | 0.03 | Other | < 0.1 |

About The Alloy

Low-alloyed copper alloys are distinguished by a high electrical conductivity. They do not reach the spring force of the bronzes, however, in comparison with pure copper, they are significantly harder. Therefore, they are predominantly used for lead frames for semiconductors.

SB01 is a copper alloy with a very low iron content. SB01 differs from SB02 (UNS C19400) by the higher thermal conductivity and the higher electrical conductivity. In comparison with pure copper SB01 has a higher strength while the electrical conductivity is a little lower. SB01 has excellent soldering and welding properties.

The alloy is registered with the U.S. EPA as Antimicrobial and with respect to Pb and Cd meets the OEKO-TEX Standard 100.

Physical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical conductivity</td>
<td>49 MS/m</td>
</tr>
<tr>
<td>Thermal conductivity</td>
<td>430 W/(m-K)</td>
</tr>
<tr>
<td>Thermal expansion coefficient **</td>
<td>17 10-6/K</td>
</tr>
<tr>
<td>Density</td>
<td>8.9 g/cm³</td>
</tr>
<tr>
<td>Modulus of elasticity</td>
<td>125 GPa</td>
</tr>
<tr>
<td></td>
<td>= kN/mm²</td>
</tr>
</tbody>
</table>

* Reference values at room temperature
** Between 20 and 300 °C

Typical Applications

- Age-hardenable alloys for connectors and power transistor carriers and semiconductor devices
- Leaf springs for relays
- Stamped-bent parts
- Transistor carriers
- Connector pins
- Carriers
- Car electrics

Mechanical Properties *

<table>
<thead>
<tr>
<th>Temper condition</th>
<th>0 R 300</th>
<th>H02 R 360</th>
<th>H04 R 390</th>
<th>H06 R 415</th>
<th>H08 R 450</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>H 80</td>
<td>H 100</td>
<td>H 110</td>
<td>H 130</td>
<td>H 130</td>
</tr>
<tr>
<td>Tensile strength in N/mm²</td>
<td>300 - 380</td>
<td>360 - 440</td>
<td>390 - 450</td>
<td>415 - 480</td>
<td>450 - 520</td>
</tr>
<tr>
<td>0.2 % yield Strength in N/mm²</td>
<td>&lt; 300</td>
<td>280</td>
<td>330</td>
<td>380</td>
<td>430</td>
</tr>
<tr>
<td>Elongation A₉₅ %</td>
<td>&gt; 15</td>
<td>&gt; 6</td>
<td>&gt; 3</td>
<td>&gt; 3</td>
<td>&gt; 2</td>
</tr>
<tr>
<td>Vickers hardness HV</td>
<td>80 - 110</td>
<td>100 - 130</td>
<td>110 - 140</td>
<td>120 - 145</td>
<td>130 - 160</td>
</tr>
<tr>
<td>Electrical conductivity in % IACS</td>
<td>85</td>
<td>85</td>
<td>84</td>
<td>84</td>
<td>84</td>
</tr>
</tbody>
</table>

Minimum radius of the bending mandrel for 90° bend and strip thickness s, tempered quality

<table>
<thead>
<tr>
<th>s (mm)</th>
<th>Transverse</th>
<th>Parallel</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.10 ≤ s ≤ 0.25 mm</td>
<td>0 x s</td>
<td>0 x s</td>
</tr>
<tr>
<td></td>
<td>0 x s</td>
<td>0 x s</td>
</tr>
<tr>
<td></td>
<td>1 x s</td>
<td>1 x s</td>
</tr>
<tr>
<td></td>
<td>1 x s</td>
<td>1 x s</td>
</tr>
<tr>
<td></td>
<td>1.5 x s</td>
<td>1.5 x s</td>
</tr>
<tr>
<td>0.25 &lt; s ≤ 0.5 mm</td>
<td>0 x s</td>
<td>0 x s</td>
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<tr>
<td></td>
<td>0 x s</td>
<td>0 x s</td>
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<td>1 x s</td>
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*) Reference values
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SB01

Processing Instructions
Cold forming properties: very good
Machinability: sufficient
Electroplating properties: very good
Hot-dip tinning properties: very good
Soldering: very good
Resistance welding: good
Gas shielded arc welding: good
Laser welding: good

Available Dimensions
Bright pre-rolled strips 1 to 2.5 mm
Precision strip thickness from 0.05 to 1.2 mm
Strip width from 3.0 to 600 mm, but at least 10 times of the strip thickness
Other widths available on request.

Available Versions
Coils with standard outer diameters of 1200 mm
Strips in reel form with coil weight of up to 1500 kg
Multipancake up to 2.5 t
Hot-dip tinned strips
Profiled strips
Electroplated strips (tin, nickel)

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