**CuSn2Fe0.1**

**Comparables standards:** UNS C50715  
**Aurubis designations:** KLF5• • PNA 328  
*KLF5 is a trademark licensed by Kobelco*

**Description**

CuSn2Fe0.1 is a solid solution and precipitation strengthened copper alloy (bronze). This alloy has good corrosion resistance, very good cold workability and good electrical conductivity of min. 30% IACS.  
Due to the Fe-P precipitates the alloy has high strength and good relaxation behaviour, thus it can be used at elevated temperatures and where high strength in combination with conductivity is required.  
Fields of application are Stamped parts, connectors, contact springs and switch elements and components for electrical engineering.

**Composition**

<table>
<thead>
<tr>
<th>Cu</th>
<th>Sn</th>
<th>Fe</th>
<th>P</th>
<th>Pb</th>
</tr>
</thead>
<tbody>
<tr>
<td>[%]</td>
<td>[%]</td>
<td>[%]</td>
<td>[%]</td>
<td>[%]</td>
</tr>
<tr>
<td>rem</td>
<td>1.7-2.3</td>
<td>0.05-0.15</td>
<td>0.025-0.04</td>
<td>0.02 max</td>
</tr>
</tbody>
</table>

Composition of this alloy is in accordance with RoHS for electric & electronic components and ELV for the automotive industry.

**Physical properties**

<table>
<thead>
<tr>
<th>Melting point</th>
<th>Density</th>
<th>$c_p$ @ 20°C</th>
<th>Young's modulus</th>
<th>Thermal cond.</th>
<th>Electrical cond.</th>
<th>$\alpha$ @ 20-300°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>°C</td>
<td>[g/cm³]</td>
<td>[kJ/kgK]</td>
<td>[GPa]</td>
<td>[W/mK]</td>
<td>[%IACS]</td>
<td>10⁻⁶[K]</td>
</tr>
<tr>
<td>1060</td>
<td>8.9</td>
<td>0.38</td>
<td>121</td>
<td>140</td>
<td>≥18</td>
<td>≥31</td>
</tr>
</tbody>
</table>

Note: The specified conductivity applies to the soft condition only.  
$c_p$ specific heat capacity  
$\alpha$ coefficient of thermal expansion

**Mechanical properties**

<table>
<thead>
<tr>
<th>Tensile Strength</th>
<th>Yield Strength</th>
<th>Elongation $A_{el}$</th>
<th>Hardness</th>
<th>Bend ratio 90°</th>
<th>Bend ratio 180°</th>
</tr>
</thead>
<tbody>
<tr>
<td>[MPa]</td>
<td>[MPa]</td>
<td>[%]</td>
<td>[HV]</td>
<td>[r]</td>
<td>[r]</td>
</tr>
<tr>
<td>R390</td>
<td>395-500</td>
<td>290-415</td>
<td>≥16</td>
<td>120-140</td>
<td>0</td>
</tr>
<tr>
<td>R510</td>
<td>515-600</td>
<td>440-545</td>
<td>≥6</td>
<td>150-180</td>
<td>0</td>
</tr>
<tr>
<td>R550</td>
<td>555-625</td>
<td>490-570</td>
<td>≥5</td>
<td>165-185</td>
<td>0</td>
</tr>
<tr>
<td>R600</td>
<td>605-665</td>
<td>550-625</td>
<td>≥3</td>
<td>180-200</td>
<td>0</td>
</tr>
</tbody>
</table>

$r = \pi \times t$ (thickness $t \leq 0.5$mm)  
GW bend axis transverse to rolling direction. BW bend axis parallel to rolling direction.

**Fabrication properties**

- Cold formability: excellent  
- Hot formability: fair  
- Soldering: excellent  
- Brazing: excellent  
- Oxyacetylene welding: fair  
- Gas shielded arc welding: good  
- Resistance welding: good  
- Machinability: not recommended

**Electrical conductivity**

The electrical conductivity depends on chemical composition, the level of cold deformation and the grain size. A high level of deformation as well as a small grain size decrease the conductivity.
**Corrosion Resistance**

CuSn2Fe0.1 is resistant to: Natural and industrial atmospheres as well as maritime air, drinking and service water, non oxidizing acids, alkaline solutions and neutral saline solutions.

CuSn2Fe0.1 is not resistant to: Ammonia, halogenide, cyanide and hydrogen sulfide solutions and atmospheres, oxidizing acids and sea water (especially at high flow rates).

CuSn2Fe0.1 is resistant to pitting corrosion, even in sea water.

**Typical uses**

Stamped parts, components of electrical engineering, connectors, contact springs, switch elements

**Relaxation Behaviour**

Stress relaxation data shown as residual stress against Larson Miller Parameter. The Larson Miller Parameter represents temperature and time.

Test method: Mandrel test according to ASTM E328.

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