**CuFe2PMg**

**Comparable standards:** UNS C19400 • EN CW107C • JIS C1940
**Aurubis designations:** C194 • PNA 206

**Description**  
CuFe2PMg, a modification of alloy CuFe2P, combines strength with good electrical (min. 62% IACS) and thermal conductivity. The addition of a small amount of magnesium enables age hardening and results in higher strength levels compared to CuFe2P. Plasticity and stress relaxation behavior are also improved. The alloy exhibits a very good formability, can be soldered and welded and has a good corrosion resistance. Fields of application are in the automotive industry, connectors, spring contacts and semiconductors.

**Composition**

<table>
<thead>
<tr>
<th></th>
<th>Cu</th>
<th>Fe</th>
<th>P</th>
<th>Mg</th>
<th>Zn</th>
<th>Pb</th>
</tr>
</thead>
<tbody>
<tr>
<td>rem</td>
<td>2.10-2.60</td>
<td>0.015-0.15</td>
<td>0.03-0.08</td>
<td>0.05-0.20</td>
<td>0.03 max</td>
<td></td>
</tr>
</tbody>
</table>

This alloy is in accordance with RoHS 2002/96/CE for electric & electronic components and 2002/53/CE for the automotive industry.

**Physical properties**

<table>
<thead>
<tr>
<th>Melting point [°C]</th>
<th>Density [g/cm³]</th>
<th>cp @ 20°C [kJ/kgK]</th>
<th>Electrical cond. [%IACS]</th>
<th>Thermal cond. [W/mK]</th>
<th>Young's modulus [GPa]</th>
<th>α @ 20°C [10⁻⁶/K]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1088</td>
<td>8.8</td>
<td>0.386</td>
<td>≥60</td>
<td>265</td>
<td>123</td>
<td>17.6</td>
</tr>
</tbody>
</table>

Note: The specified conductivity applies to the soft condition only.

**Mechanical properties**

<table>
<thead>
<tr>
<th></th>
<th>Tensile Strength [MPa]</th>
<th>Yield Strength [MPa]</th>
<th>Elongation A₅₀ [%]</th>
<th>Hardness HV</th>
<th>Bend ratio 90° [r]</th>
<th>Bend ratio 180° [r]</th>
</tr>
</thead>
<tbody>
<tr>
<td>R300</td>
<td>300-340</td>
<td>≤ 240</td>
<td>≥ 16</td>
<td>80-100</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>R340</td>
<td>340-390</td>
<td>≥ 240</td>
<td>≥ 8</td>
<td>100-120</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>R370</td>
<td>370-430</td>
<td>≥ 330</td>
<td>≥ 6</td>
<td>120-140</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>R420</td>
<td>420-480</td>
<td>≥ 380</td>
<td>≥ 5</td>
<td>130-150</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>R470</td>
<td>470-530</td>
<td>≥ 440</td>
<td>≥ 4</td>
<td>140-160</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>R530</td>
<td>530-580</td>
<td>≥ 470</td>
<td>≥ 4</td>
<td>150-165</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Other tempers are available upon request.

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

GW bend axis transverse to rolling direction. BW bend axis parallel to rolling direction.

**Fabrication properties**

**Comparable standards:**
- UNS C19400 • EN CW107C • JIS C1940
- C194 • PNA 206

**Aurubis**

Aurubis.com
Material Datasheet  CuFe2PMg

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
CuFe2PMg 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.
CuFe2PMg is not resistant to: Ammonia, halogenide, cyanide and hydrogen sulfide solutions and atmospheres, oxidizing acids and sea water (especially at high flow rates).
Cu alloys containing Fe have an improved corrosion resistance compared to pure copper, especially towards salt bearing and alkaline water. More over these alloys are more resistant to pitting- and erosion corrosion.

Typical uses
Automotive, electrical engineering, connectors, contact springs, semiconductor basis

Relaxation Behaviour
Stress relaxation data of CuFe2P shown as residual stress against Larsen Miller Parameter. The Larsen Miller Parameter represents temperature and time. Test method: Mandrel test according to ASTM E328.

This leaflet is for general information only and is not subject to revision. No claims can be derived from it unless there is evidence of intent or gross negligence. The data given are no warranty that the product is of a specified quality and they cannot replace expert advice or the customer’s own test.