Wieland-L13
CuNi10Fe1Mn

Material properties and typical applications

Wieland-L13 is a corrosion resistant alloy with good hard soldering and welding properties, good cold formability, high temperature strength and excellent corrosion resistance to sea water in particular.

Applications: Heat exchanger, apparatus construction, Oilcooler, Fresh water maker, Air conditioner, finned tubes, Brake lines

Types of delivery

The BU Extruded Products supplies bars, wire, profiles and tubes. Please get in touch with your contact person regarding available delivery forms, dimensions, and tempers.

Composition

CuNi10Fe1Mn is resistant to moisture, non-oxidizing acids, to dry gases such as oxygen, chlorine, hydrogen chloride, hydrogen fluoride, sulfur dioxide, carbon dioxide. Furthermore it is resistant to pitting- and stress corrosion cracking, as well as to hot seawater. Flow rates up to 6 m/s are possible.

Composition

- Cu
- Ni 9.0 – 11.0 %
- Fe 1.0 – 2.0 %
- Mn 0.5 – 1.0 %
- P, Pb max 0.02 %
- S, C, Sn max 0.05 %
- Zn max 0.5 %

Material designation

- EN CuNi10Fe1Mn CW352H
- UNS C70600
- EEMUA UNS 7060X
- BS CN 102

Physical properties

- Spec. heat 20° J/kg K 377
- Thermal conductivity W/(mK) 46
- Coefficient of thermal expansion (20–100 °C) 10^-6/K 17
- Density g/cm³ 8.9
- Modul of elasticity GPa 130
- Electrical resistance (20°C annealed) μOhm cm 19

Fabrication properties

- Machinability: Less suitable (~20 %)
- Cold forming: excellent
- Warm forming: good

Joining

- WIG welding: excellent
- MIG welding: excellent
- Hard soldering: excellent
- Soft soldering: excellent
- Resistance welding: excellent

Heat treatment

- Melting point: 1130 - 1160°C
- Hot working: 950 – 1050°C
- Soft annealing: 680 – 750°C
- Thermal stress relieving: 400 – 450°C

Surface treatment

- Polishing mechanical: good
- Electrolyt: good

Corrosion resistance

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Flow rates up to 6 m/s are possible.

Product standards

- tube EN 12451, EN 12449
- bars EN 12163
- profile
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**Mechanical properties** (values can be achieved and are a function of size and form)

<table>
<thead>
<tr>
<th>Reference values at 20°C</th>
<th>annealed R290</th>
<th>R310</th>
<th>R480</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile strength [MPa]</td>
<td>≥ 290</td>
<td>≥ 310</td>
<td>≥ 480</td>
</tr>
<tr>
<td>Yield strength [MPa]</td>
<td>≥ 90</td>
<td>≥ 220</td>
<td>≥ 400</td>
</tr>
<tr>
<td>Elongation A5 [%]</td>
<td>≥ 30</td>
<td>≥ 12</td>
<td>≥ 8</td>
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<tr>
<td>Vickers hardness</td>
<td>75 - 105</td>
<td>105 - 150</td>
<td>≥ 150</td>
</tr>
</tbody>
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