Material data sheet

Material designation SCHMELZMETALL
Material designation, EN standard CuNi2Be
Material No., EN standard CW110C
Material No., former DIN standard 2.0850 (CuNi2Be)
Material No., UNS system (ASTM) C17510
Classification RWMA (USA) Class 3/1

Information about standards
EN EN12163 (Round bars), EN12167 (Flat bars, profiles), EN12420 (Forged products)
DIN (former) DIN17666/DIN17672
ASTM B441. B534

Description of material
HOVADUR® CNB is a thermally precipitation hardenable copper alloy. In heat treated condition, the material is characterized by high electrical and thermal conductivity combined with very good hardness and resistance to heat. Compared to our alloy HOVADUR® CNB spez, HOVADUR® CNB shows less hardness at equal (electrical or thermal) conductivity, but accordingly it is a bit more ductile. HOVADUR® CNB completely meets all requirements of the standard.

Safety data sheet
SCHMELZMETALL No. 07.02E (Issue 30.07.2002)

Material properties
Chemical composition in % of weight (guaranteed ranges)

<table>
<thead>
<tr>
<th>Ni</th>
<th>Be</th>
<th>Co</th>
<th>Fe</th>
<th>Si</th>
<th>others total</th>
<th>Cu</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.4–2.4</td>
<td>0.2–0.6</td>
<td>max. 0.3</td>
<td>max. 0.2</td>
<td>max. 0.2</td>
<td>0.5</td>
<td>Remainder</td>
</tr>
</tbody>
</table>

Agreed properties at 20 °C (Condition: hardened)

<table>
<thead>
<tr>
<th>Hardness Brinell HB</th>
<th>min. 200 *)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical conductivity</td>
<td>MS/m</td>
</tr>
</tbody>
</table>

*) In case of different opinions, hardness is calculated as the average of 3 randomly located measurements.

Associated properties at 20 °C (Condition: hardened)

| Tensile strength | 1) N/mm² (MPa) | min. 650 |
| 0.2% yield strength | 1) N/mm² (MPa) | min. 500 |
| Elongation (AS) | 1) % | min. 10 |

1) Strength values will only be proved if ordered by the customer.

Material information (nominal values)

| Elastic modulus | N/mm² (MPa) | 135,000 |
| Softening temperature | °C | 480 |
| Specific weight | g/cm³ | 8.85 |
| Thermal conductivity | W/mK | 270–320 (Average 20 °C–300 °C) |
| Thermal expansion coefficient | x 10⁻⁶/°K | 17.2 (Average 20 °C–300 °C) |
| Melting interval | °C | 1000–1030 |
Processing instructions

Hot forming
HOVADUR® CNB is suitable for hot forming at temperatures of about 900–700 °C. After forming, quick cooling in water is recommended.
Advice: After a hot forming executed by the customer, the properties of HOVADUR® CNB will normally no longer be achieved.

Cold forming
HOVADUR® CNB in hardened condition is not intended for cold forming. In case, a cold forming has to be executed, HOVADUR® CNB in solution heat treated condition has to be used.
After forming, as a rule, the part has to be heat treated.

Heat treatment
A heat treatment changes the agreed properties. If a heat treatment is executed after supply of the material, we cannot guarantee any properties.
Advice for heat treatments (they always depend to a large degree on the kind and the function of the furnace)
Solution heat treatment: 900–960 °C, about 30 minutes followed by quenching in water
Hardening: 460–520 °C, 2–5 h followed by cooling at the air

Machining
HOVADUR® CNB is very suitable for machining. We recommend hard metal cutting tools with positive cutting geometry.
For drilling, attention must be paid to good removal of chips. Cooling with emulsion is recommended.
In case of dry machining, this has to be done with strong suction. Outgoing air has to be cleaned by a particle filter.
Thread moulding is possible to a limited degree. Bigger inside threads should be executed by circular thread milling.

Joining
HOVADUR® CNB is suitable for soft as well as hard soldering. Concerning hard soldering (even at limited time of effect of the temperature), a loss in hardness in the area of heating is to be expected. A very low melting silver brazing should be used and the brazing process itself should be as short as possible. HOVADUR® CNB is suited for welding. Attention must be paid to sufficient extraction and filtering of welding fume.

Application examples

Electrodes, holders, shafts for spot, seam, butt and projection welding of (preferably) materials of higher strength and greater electrical resistance (e.g. stainless and heat-resistant steels), welded wire mesh.
Moulds for non-ferrous metal casting, inserts in steel moulds at spots requiring a faster cooling speed.
Thermally highly strained parts susceptible to fire cracks.

Details of the properties or application of materials are for descriptive purposes only. Confirmation of suitability with regard to specific properties or application require written agreement.