

## Material data sheet

Issue No. 02EN

## HOVADUR® CCNB eh

2006-04-01

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Material designation SCHMELZMETALL

**HOVADUR® CCNB eh**

Material designation, EN standard

CuCo1Ni1Be

Material No., EN standard

CW103C

Material No., former DIN standard

None. Comparable to 2.1285 (CuCo2Be)

Material No., UNS system (ASTM)

None. Comparable to C17500 (CuCo2Be)

Classification RWMA (USA)

Class 3

### Information about standards

EN **EN12163** (Round bars), **EN12167** (Flat bars, profiles), **EN12420** (Forged products) – but the properties of HOVADUR® CCNB eh exceed considerably the requirements of the standards.

DIN (former) (DIN17666/DIN17672)

ASTM (B441, B534)

### Description of material

HOVADUR® CCNB eh is a thermally precipitation hardenable copper alloy. In heat treated condition, the alloy combines high hardness and high resistance to heat with good electrical and thermal conductivity.

Due to vacuum technology and special processes, clearly better properties compared to standard quality HOVADUR® CCNB can be agreed.

### Safety data sheet

SCHMELZMETALL No. 07.02E (Issue 30.07.2002)

### Material properties

Chemical composition in % of weight (guaranteed ranges)

Co	Ni	Be	Fe	Si	others total	Cu
0.8–1.3	0.8–1.3	0.4–0.7	max. 0.2	max. 0.2	0.5	Remainder

**Agreed properties at 20 °C** (Condition: hardened, solution heat treated respectively)

Condition		hardened	solution heat treated
Hardness Brinell HB		min. 260 *)	max. 110 *)
Electrical conductivity	MS/m	min. 28	max. 13
Electrical conductivity	% IACS	min. 48.0	max. 22.5

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

**Associated properties at 20 °C** (Condition: hardened, solution heat treated respectively)

Condition		hardened	solution heat treated
Tensile strength	1) N/mm <sup>2</sup> (MPa)	min. 750	max. 500
0.2% yield strength	1) N/mm <sup>2</sup> (MPa)	min. 650	max. 400
Elongation (A5)	1) %	min. 8	min. 25

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

### Material information (nominal values)

Elastic modulus	N/mm <sup>2</sup> (MPa)	135,000	
Softening temperature	°C	480	
Specific weight	g/cm <sup>3</sup>	8.85	
Thermal conductivity	W/mK	230–250	(Average 20 °C–300 °C)
Thermal expansion coefficient	x 10 <sup>-6</sup> /°K	17.2	(Average 20 °C–300 °C)
Melting interval	°C	1000–1030	

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### Processing instructions

#### Hot forming

HOVADUR® CCNB eh 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® CCNB eh will normally no longer be achieved.**

#### Cold forming

HOVADUR® CCNB eh in hardened condition is not intended for cold forming. In case, a cold forming has to be executed, HOVADUR® CCNB eh 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: 930–970 °C, about 30 minutes followed by quenching in water

Hardening: 460–500 °C, 2–5 h followed by cooling at the air

#### Machining

HOVADUR® CCNB eh 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 extent. Bigger inside threads should be executed by circular thread milling.

#### Joining

HOVADUR® CCNB eh 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® CCNB eh 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.

Die casting pistons for horizontal cold chamber casting machines for light metal casting.

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.