

Material data sheet

Issue No. 02EN

HOVADUR® CNB spez

2006-04-01

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Material designation SCHMELZMETALL

Material designation, EN standard

Material No., EN standard

Material No., former DIN standard

Material No., UNS system (ASTM)

Classification RWMA (USA)

HOVADUR® CNB spez

CuNi2Be

CW110C

2.0850 (CuNi2Be)

C17510

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 spez 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. The alloy is especially applied where high electrical (or thermal) conductivity combined with great hardness is indispensable. Due to vacuum technology and special processes, clearly better properties compared to standard quality HOVADUR® CNB can be agreed.

Safety data sheet

SCHMELZMETALL No. 07.02E (Issue 30.07.2002)

Material properties

Chemical composition in % of weight (guaranteed ranges)

Ni	Be	Co	Fe	Si	others total	Cu
1.4–2.4	0.2–0.6	max. 0.3	max. 0.2	max. 0.2	0.5	Remainder

Agreed properties at 20 °C (Condition: hardened)

Hardness Brinell HB		min. 220 *)	
Electrical conductivity	MS/m	min. 38	(min. 65.5% IACS)

*) 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/mm ² (MPa)	min. 680
0.2% yield strength	1)	N/mm ² (MPa)	min. 540
Elongation (A5)	1)	%	min. 8

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

Material information (nominal values)

Elastic modulus	N/mm ² (MPa)	135,000	
Softening temperature	°C	480	
Specific weight	g/cm ³	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	

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Processing instructions

Hot forming

HOVADUR® CNB spez 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 spez will normally no longer be achieved.

Cold forming

HOVADUR® CNB spez in hardened condition is not intended for cold forming. In case, a cold forming has to be executed, HOVADUR® CNB spez 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 spez 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® CNB spez 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 spez 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. In case of materials with normal strength, life time of the electrodes will increase accordingly.

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.