SCHMELZMETALL

Material data sheet HOVADUR® CNB

Material designation SCHMELZMETALL	**HOVADUR® CNB**
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)

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. 200 *)**	
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 measurings.**

Associated properties at 20 °C (Condition: hardened)

Tensile strength	1)	N/mm^2 (MPa)	min. 650
0.2% yield strength	1)	N/mm^2 (MPa)	min. 500
Elongation (A5)	1)	%	min. 10

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	

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.