SCHMELZMETALL

Material data sheet
HOVADUR® CNCS-EH

Material designation SCHMELZMETALL:	**HOVADUR® CNCS-EH**
Material designation, EN standard:	not standardized [similar to CuNi3Si]
Material No., EN standard:	not standardized [similar to CW112C]
Material No., former DIN standard:	not standardized [similar to 2.0857]
Material No., UNS system (ASTM):	C18000

Information about standards

EN	not standardized
DIN (former)	(DIN17672, for similar alloy CuNi3Si)
ASTM	not standardized

Description of material

HOVADUR® CNCS-EH is a thermally precipitation hardenable copper-nickel-silicium alloy with addition of chromium.

The alloy is optimized for high hardness and strength. At the same time, it shows sufficient thermal conductivity combined with good resistance to corrosion and abrasion.

HOVADUR® CNCS-EH is applied in many cases which require a Be-free alloy.

Material properties

Chemical composition in % of weight [guaranteed ranges]

Ni	Si	Cr	Fe	Mn	Pb	others total	Cu
3 – 4	0,5 – 1	0,2 – 0,5	max. 0,15	max. 0,1	max. 0,02	max. 0,1	Rest

Agreed properties at 20°C [Condition: hardened]

Condition	Hardness Brinell HB	Electrical conductivity MS/m
CNCS-EH	min. 240 *)	min. 19

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

Associated properties at 20°C [Condition: hardened]

Condition	Tensile strength **) [N/mm² (MPa)]	0,2% -Yield strength **) [N/mm² (MPa)]	Elongation (A5) **) [%]
CNCS-EH	min. 740	min. 660	min. 6

**) Strength values will only be proved when ordered by the customer

Material information (nominal values)

Elastic modulus	N/mm²(MPa)	140 000	
Softening temperature	°C	480	
Specific weight	g/cm³	8,8	
Thermal conductivity	W/mK	165-205	**(Average 20 °C – 300 °C)**
Thermal expansion coefficient	x 10-6 / °K	16,2	**(Average 20 °C – 300 °C)**
Melting interval	°C	1060 – 1085	

Processing instructions

Hot forming:

HOVADUR® CNCS-EH is very well suitable for hot forming at temperatures of about 900-700°C.
After forming, quick cooling in water is recommended.

Advice: After an external hot forming, the properties of HOVADUR® CNCS-EH will normally no longer be achieved.

Cold forming:

HOVADUR® CNCS-EH in hardened condition is not intended for cold forming, at least only to a very limited extent.
In case a cold forming has to be executed, HOVADUR® CNCS-EH in solution heat treated condition has to be used.
Normally, after forming 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 by SCHMELZMETALL, 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:

850 - 900°C, about 30 minutes, followed by quenching in water

Hardening:

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

Machining:

HOVADUR® CNCS-EH is well suited for machining.
We recommend standard hard metal tools and cooling with emulsion.

HOVADUR® CNCS-EH is well suited for eroding.
But due to its relatively high electrical conductivity, conditions are more difficult.

No special measures are necessary for grinding and polishing.
Surface may be coated according to all usual procedures.

Joining:

HOVADUR® CNCS-EH is well suited for soldering. Concerning hard soldering, a loss in hardness is to be expected.
A very low melting silver brazing should be used.

HOVADUR® CNCS-EH is very well suited for joining by welding. Build-up welding by MIG / MAG as well as TIG welding is very suitable, too.

Application examples

Die casting pistons in cold chamber die casting machines, cooling inserts in moulds, moulds for non-ferrous metal casting (e. g. low pressure casting).

Hot pressed parts for electrical engineering, fittings, braces and fixing elements for high strain, especially for aerial wire and marine applications.

Be-free alternative for electrodes for resistance welding.