

## Material data sheet

## HOVADUR® CB2

Issue No. 03EN

2018-05-28

Page 1 / 2

Material designation SCHMELZMETALL:  
Material designation, EN standard:  
Material No., EN standard:  
Material No., former DIN standard:  
Material No., UNS system (ASTM):  
Classification RWMA (U.S.A.):

**HOVADUR® CB2**  
CuBe2  
CW101C  
2.1247  
similar C17200  
Class 4

### Information about standards

EN **EN12163** (Round bars), **EN1267**, (Flat bars, profiles), **EN12420** (Forged products)  
DIN (former) (DIN17666/DIN17672)  
ASTM (B196 / B570)

### Description of material

HOVADUR® CB2 is a thermally precipitation hardenable copper alloy. In heat treated condition, the alloy shows extraordinary high hardness and strength combined with good values for electrical and thermal conductivity. Good resistance to corrosion (against seawater even excellent), high wear resistance and high resistance against seizing, good polishing properties and absence of sparking complete the excellent range of properties of this alloy.

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

### Material properties

#### Chemical composition in % of weight (guaranteed ranges)

| Be      | Co    | Ni    | Co + Ni | Fe       | Si       | others total | Cu        |
|---------|-------|-------|---------|----------|----------|--------------|-----------|
| 1,8-2,0 | 0-0,3 | 0-0,3 | 0,2-0,5 | max. 0,1 | max. 0,1 | max. 0,5     | Remainder |

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

| Condition               |        | hardened    | Solution heat treated |
|-------------------------|--------|-------------|-----------------------|
| Hardness Brinell HB     |        | min. 350 *) | max. 125 *)           |
| Electrical conductivity | MS/m   | min. 16     | max. 12               |
| Electrical conductivity | % IACS | min. 27,6   | max. 20,7             |

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

#### Associated properties at 20°C [Condition: **hardened**, solution heat treated respectively]

| Condition           |                | hardened  | solution heat treated |
|---------------------|----------------|-----------|-----------------------|
| Tensile strength    | 1) N/mm² (MPa) | min. 1150 | max. 600              |
| 0,2% yield strength | 1) N/mm² (MPa) | min. 1000 | max. 350              |
| Elongation (A5)     | 1) %           | min.3     | min. 35               |

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          | 300       |                         |
| Specific weight               | g/cm³       | 8,3       |                         |
| Thermal conductivity          | W/mK        | 160       | (Average 20°C – 300 °C) |
| Thermal expansion coefficient | x 10-6 / °K | 17,0      | (Average 20°C – 300 °C) |
| Melting interval              | °C          | 870 - 970 |                         |

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.

## Material data sheet

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Page 1 / 2

### Processing instructions

#### Hot forming:

HOVADUR® CB2 is suitable for hot forming at temperatures of about 800-650°C. After forming, quick cooling in water is recommended.

**Advice:** After a hot forming executed by the customer, the properties of HOVADUR® CB2 will normally no longer be achieved.

#### Cold forming:

HOVADUR® CB2 in hardened condition is not intended for cold forming. In case, a cold forming has to be executed, HOVADUR® CB2 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: 760-800°C, about 30 minutes followed by quenching in water

Hardening: 310-340 °C, 2 – 5h followed by cooling at the air

#### Machining:

HOVADUR® CB2 is 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.**

In case of more important machining work, we recommend pre-machining in solution heat treated condition.

Bigger inside threads should be executed by circular thread milling.

#### Joining:

HOVADUR® CB2 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® CB2 is suited for welding. **Attention must be paid to sufficient extraction and filtering of welding fume.**

### Application examples

Mechanically highly strained jaws, holders and guide rails for flash butt welding and projection welding.

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

High-strength and corrosion-resistant parts for marine applications.