

## TUNGSTEN-COPPER COMPOSITE MATERIALS

### Product description:

Tungsten-copper composite materials are produced by copper infiltration of porous pre-sintered tungsten. They are available with different copper contents.

A thermal conductivity over 200 W/m\*K is producible.

### Range of application:

Switching contacts for high-voltage and medium-voltage, components for passive thermal management (heat sinks), electrodes for erosive processing.

### Typical properties:

Material	WCu	70/30	75/25	80/20	85/15	90/10
Tungsten content	%	70 ± 3	75 ± 3	80 ± 3	85 ± 3	90 ± 3
Copper content	%	30 ± 3	25 ± 3	20 ± 3	15 ± 3	10 ± 3
Density	g/cm <sup>3</sup>	14,30 ± 0,40	14,95 ± 0,40	15,65 ± 0,50	16,44 ± 0,50	17,30 ± 0,50
Hardness	HB2,5/62,5	160 - 220	160 - 220	180 - 240	190 - 260	220 - 290
Median coefficient of linear thermal expansion (20 – 100 °C)	10 <sup>-6</sup> /K	8,8	8,5	8,3	7,2	6,1
(20 – 300 °C)	10 <sup>-6</sup> /K	9,2	9,0	8,7	7,6	6,4
(20 – 450 °C)	10 <sup>-6</sup> /K	9,5	9,2	9,0	8,0	6,7
Young' s modulus (Nominal value)	GPa	220	240	280	290	340
Ultimate tensile strength	MPa	350	400	440	460	480
Typical value		500	520	540	560	580
Electrical conductivity	%IACS MS/m	≥ 30 ≥ 18	≥ 27 ≥ 16	≥ 25 ≥ 14,5	≥ 25 ≥ 14,5	≥ 25 ≥ 14,5
Specific electrical resistance	Ω*mm <sup>2</sup> /m	≤0,040	≤0,047	≤0,050	≤0,050	≤0,052
Thermal conductivity	W/m*K	150 - 240	145 - 230	140 - 220	135 - 210	130 - 200

Nummer PD-7102  
Stand 1-2020-11-19

**Delivery form:**

The products may be delivered as semi-finished products for further machining by the customer or according to customer drawing as finished product.

H.C. Starck Hermsdorf GmbH  
Robert-Friese-Strasse 4  
07629 Hermsdorf  
Phone +49 36601 922-101, Fax +49 36601 922-111

H.C. Starck   
High Performance Metal Solutions

[info@hcstarcksolutions.com](mailto:info@hcstarcksolutions.com)

[www.hcstarcksolutions.com](http://www.hcstarcksolutions.com)

The conditions of your use and application of our products, technical assistance and information (whether verbal, written by way of production evaluations), including any suggested formulations and recommendations, are beyond our control. Therefore, it is imperative that you test our products, technical assistance and information to determine to your own satisfaction whether they are suitable for your intended uses and applications. This application-specific analysis must at least include testing to determine suitability from a technical as well as health, safety, and environmental standpoint. Such tests do not necessarily need to be performed by H. C. Starck. All information is without warranty or guarantee. It formally must be understood and agreed that the customer assumes and hereby expressly releases H. C. Starck from all liability, in tort, contract or otherwise, incurred in connection with the use of our products, technical assistance and information. Any statement or recommendation not contained herein is unauthorized and shall not bind H. C. Starck. Nothing herein shall be construed as a recommendation to use any product in conflict with patents covering any material or its use. No license is implied or in fact granted under the claims of any patent. In case of order please refer to issue number of this product data sheet. All deliveries are based on the latest issue of the product data sheet and the latest version of our General Conditions of Sales and Delivery.