



# ZIRCONIUM DIBORIDE POWDER

Zirconium Diboride ( $ZrB_2$ ) belongs to the group of metallic hard materials. Beside having an extreme hardness, it is outstanding for its excellent electrical conductivity and good thermal shock resistance. In addition, it is corrosion resistant in contact with ferrous and nonferrous metal melts.



Zirconium Diboride

## Properties

Product data		
Chemical formula		$ZrB_2$
Molecular weight	g/mol	112.84
Crystal structure		hexagonal
Density	kg/m <sup>3</sup>	6.090
Melting point	°C	2.990
Hardness (Mohs scale)	*)	8
Hardness (Knoop scale), HK 0.1	N/mm <sup>2</sup> *)	1.800
Thermal expansion (20-1000 °C)	K <sup>-1</sup> *)	$5.7-7.5 \cdot 10^{-6}$
Thermal conductivity (at room temperature)	W/m · K *)	100
Electrical resistivity (at room temperature)	Ω cm*)	$9.2 \cdot 10^{-6}$
Young's modulus	MPa*)	450
Maximum application temperature, - oxidizing atmosphere - inert atmosphere	°C °C	800 2.400

\*) measured on dense shapes



Zirconium Diboride lump

## Application

- Additive for carbon containing refractories (antioxidant)
- Component of engineered ceramic composites
- Electrode material
- Crucible material

## Chemical resistance

HCl, HF	ignorable reaction
HNO <sub>3</sub>	poor reaction
Hot H <sub>2</sub> SO <sub>4</sub>	noticeable reaction
Alkali melts, carbonate melts, bisulfate melts	not suitable
Molten non-ferrous metals	no reaction

## Chemistry (typical values)

Product data	
Grain size	- 400 mesh
Zr	> 76%
B	> 16%
C	< 1.5%
B <sub>2</sub> O <sub>3</sub>	< 1.0%
O	< 2.0%
N	< 0.3%
Fe	< 0.3%

Additional particle sizes on request.

The data presented in this leaflet are in accordance with the present state of our knowledge, but do not absolve the user from carefully checking all supplies immediately on receipt. We reserve the right to alter product constants within the scope of technical progress or new developments. The recommendations made in this leaflet should be checked by preliminary trials because of conditions during processing over which we have no control, especially where other companies' raw materials are also being used. The recommendations do not absolve the user from the obligation of investigating the possibility of infringement of third parties' rights and, if necessary, clarifying the position. Recommendations for use do not constitute a warranty, either express or implied, of the fitness or suitability of the products for a particular purpose.

The management system has been certified according to DIN EN ISO 9001, DIN EN ISO 14001.

ESK Ceramics GmbH & Co. KG  
 Max-Schaidhau-Strasse 25  
 87437 Kempten, Germany  
 www.esk.com, info@esk.com