



# TETRABOR® BORON CARBIDE TECHNICAL DATA

			Boron Carbide
Material properties	Standard	Symbol/Unit	TETRABOR®
Density	DIN EN 623-2	$\rho$ [g/cm <sup>3</sup> ]	> 2.48
Porosity	DIN EN 623-2	P [%]	< 0.5
Mean grain size		[ $\mu$ m]	< 10
Phase composition			B <sub>4</sub> C, C
Vickers hardness	DIN EN 843-4	HV 1 [GPa]	26
Knoop hardness	DIN EN 843-4	HK 0.1 [GPa]	27
Young's modulus	DIN EN 843-2	E [GPa]	410
Weibull modulus	DIN EN 843-5	m	15
Flexural strength, 4-pt bending	DIN EN 843-1	$\sigma_B$ [MPa]	460
Compressive strength	DIN 51104	$\sigma_D$ [MPa]	> 2800
Poisson ratio	DIN EN 843-2	$\nu$	0.18
Fracture toughness (SENB)		$K_{Ic}$ [MPa·m <sup>0.5</sup> ]	5
Coefficient of thermal expansion	DIN EN 821-1		
25 °C - 500 °C		$\alpha$ [10 <sup>-6</sup> /K]	4.5
500 °C - 1000 °C		$\alpha$ [10 <sup>-6</sup> /K]	6.3
Specific heat at 25 °C	DIN EN 821-3	$c_p$ [J/g K]	0.94
Thermal conductivity at 25 °C	DIN EN 821-2	$\lambda$ [W/m K]	36
Thermal stress parameters	calculated		
$R_1 = \sigma_B \cdot (1 - \nu) / (\alpha \cdot E)$		[K]	204
$R_2 = R_1 \cdot \lambda$		[W/mm]	7
Specific electrical resistance at 25 °C	DIN EN 50359	$\rho$ [ $\Omega$ cm]	1

TDS/TETRABOR®/e-03-2011

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. TETRABOR® is a registered trademark of ESK Ceramics GmbH Co. KG

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