



PROPERTIES OF BOOSTEC® SILICON CARBIDE

GENERAL

- Sintered SiC
- Lightweight material
- Exceptional thermomechanical stability
- No mechanical fatigue
- Low Coefficient of Thermal Expansion (CTE)
- High stiffness
- Excellent resistance to corrosion and abrasion
- High mechanical strength
- High thermal conductivity, similar to that of aluminium

PROPERTIES

	Temperature	Typical value	Unit	
Theoretical density	20°C	3.21	10 ³ kg/m ³	
Bulk density	20°C	3.15	10 ³ kg/m ³	
Total porosity (fully closed)	20°C	1.5	%	
Coefficient of Thermal Expansion	-200°C	0.08	10 ⁻⁶ /°C	
	20°C	2.2	10 ⁻⁶ /°C	
	500°C	4.8	10 ⁻⁶ /°C	
	1 000°C	6.0	10 ⁻⁶ /°C	
Thermal conductivity	-200°C	163	W/m.K	
	20°C	180	W/m.K	
	500°C	66	W/m.K	
	1 000°C	39	W/m.K	
Specific heat	-200°C	42	J/kg.K	
	20°C	680	J/kg.K	
	500°C	1 040	J/kg.K	
	1 000°C	1 180	J/kg.K	
Maximum thermal shock (ΔT_c)		325	°C	
Maximum temperature of use	<i>in air</i>	1 450	°C	
	<i>in inert atmosphere</i>	1 800	°C	
Vickers hardness (500g load)	20°C	22	GPa	
Bending strength (DIN EN 2188-1 & 5)				
	<i>Mechanical strength</i>	400	MPa	
	<i>Weibull modulus</i>	11		
Tensile strength	20°C	210	MPa	
Compressive strength	20°C	3 000	MPa	
K_{1C} toughness (SENB method)	20°C	4	MN.m ^{-3/2}	
Young's modulus	-200°C to 1 000°C	420	GPa	
Shear modulus	-200°C to 1 000°C	180	GPa	
Poisson's ratio	-200°C to 1 000°C	0.16		
Electrical resistivity				
	- 0,01 V/mm	20°C / 200°C	10 ⁵ / 10 ³	Ω.m
	- 100 V/mm	20°C	10 ³	Ω.m
Emissivity	-200°C to 300°C	0.7		
Outgassing (ESA EC SS-Q-70-02A)				
	- TML (Total Mass Load)	0.01	%	
	- CVCM (Collected Volatile Condensable Materials)	0.0	%	

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