

CeramTec Rocar® SiG Silicon Carbide, SiSiC

Category : Ceramic , Carbide

Material Notes:

Rocar® is an extremely lightweight silicon carbide ceramic. It permits a reduction in mass forces at high speeds, and is considered for its hardness, excellent resistance to corrosion and sudden changes in temperature, excellent anti-friction properties, and higher heat conductivity over steel. The various types of Rocar® include sintered and silicon infiltrated silicon carbide. In SiSiC, the pore cavities are filled with metallic silicon. Since shrinkage during firing is minimal, complex components can be produced with low tolerances. Its maximum application temperature is 1350°C. However, it is not suitable for use in highly alkaline media because of its content of metallic silicon.

Order this product through the following link:

http://www.lookpolymers.com/polymer_CeramTec-Rocar-SiG-Silicon-Carbide-SiSiC.php

Physical Properties	Metric	English	Comments
Density	3.07 g/cc	0.111 lb/in ³	DIN EN 623-2
Water Absorption	0.00 %	0.00 %	Open Porosity; DIN EN 623-2
Porosity	0.00 %	0.00 %	closed (approximate)
Permeability	0.00	0.00	%, Gas
Weibull Modulus	>= 14	>= 14	DINV ENV 843-5

Mechanical Properties	Metric	English	Comments
Vickers Microhardness	1200	1200	HV 0.2; Si; DINV ENV 843-4
	2700	2700	HV 0.2; SiC; DINV ENV 843-4
Tensile Strength at Break	340 MPa	49300 psi	ACMA Test #4 / DIN EN 843-1
Tensile Modulus	380 GPa	55100 ksi	Young's; DINV ENV 843-2
Flexural Strength	340 MPa	49300 psi	DIN EN 843-1
	@Temperature 20.0 °C	@Temperature 68.0 °F	
Compressive Strength	340 MPa	49300 psi	DIN EN 820-1
	@Temperature 1000 °C	@Temperature 1830 °F	
Compressive Strength	3500 MPa	508000 psi	DIN 51067T1
Poissons Ratio	0.17	0.17	DINV ENV 843-2
Fracture Toughness	4.00 MPa-m ^{1/2}	3.64 ksi-in ^{1/2}	K _{IC} (SEVNB); DIN CEN/TS 14425-1
Shear Modulus	162 GPa	23500 ksi	Calculated

Mechanical Properties	Metric	English	Comments
Thermal Properties	Metric	English	Comments
CTE, linear	3.40 $\mu\text{m}/\text{m}\cdot\text{°C}$	1.89 $\mu\text{in}/\text{in}\cdot\text{°F}$	DIN EN 821-1
	@Temperature 20.0 - 100 °C	@Temperature 68.0 - 212 °F	
	4.10 $\mu\text{m}/\text{m}\cdot\text{°C}$	2.28 $\mu\text{in}/\text{in}\cdot\text{°F}$	DIN EN 821-1
	@Temperature 20.0 - 400 °C	@Temperature 68.0 - 752 °F	
	4.40 $\mu\text{m}/\text{m}\cdot\text{°C}$	2.44 $\mu\text{in}/\text{in}\cdot\text{°F}$	DIN EN 821-1
	@Temperature 20.0 - 600 °C	@Temperature 68.0 - 1110 °F	
	4.90 $\mu\text{m}/\text{m}\cdot\text{°C}$	2.72 $\mu\text{in}/\text{in}\cdot\text{°F}$	DIN EN 821-1
	@Temperature 20.0 - 1000 °C	@Temperature 68.0 - 1830 °F	
Specific Heat Capacity	0.700 J/g-°C	0.167 BTU/lb-°F	DINV ENV 821-3
	@Temperature 20.0 °C	@Temperature 68.0 °F	
	1.30 J/g-°C	0.311 BTU/lb-°F	DINV ENV 821-3
	@Temperature 1000 °C	@Temperature 1830 °F	
Thermal Conductivity	40.0 W/m-K	278 BTU-in/hr-ft ² -°F	DIN EN 821-2
	@Temperature 1000 °C	@Temperature 1830 °F	
	115 W/m-K	798 BTU-in/hr-ft ² -°F	DIN EN 821-2
	@Temperature 20.0 °C	@Temperature 68.0 °F	
Maximum Service Temperature, Air	1350 °C	2460 °F	
Maximum Service Temperature, Inert	1350 °C	2460 °F	

Electrical Properties	Metric	English	Comments
Volume Resistivity	$\leq 1.0 \text{ ohm}\cdot\text{cm}$	$\leq 1.0 \text{ ohm}\cdot\text{cm}$	IEC 672-1
	@Temperature 20.0 °C	@Temperature 68.0 °F	
	100 ohm-cm	100 ohm-cm	IEC 672-1
	@Temperature 400 °C	@Temperature 752 °F	

Descriptive Properties	Value	Comments
Ra = Arithmetic Mean Roughness Value (μm)	<0.03	
Thermal Shock Resistance R1 (K)	181	calculated; $R1 = [s^2 (1-\mu)] / (a-E)$

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