CVD SILICON CARBIDE® Material Specification for
Grades: SC-001, SC-002, SC-003

Properties	***Typical Values[1]***
Crystal Structure	FCC(face-centered cubic); polycrystalline, ß-phase
Sublimation Temperature (C)	~2700
Average Grain Size (µm)	5
Density (g cm^{-3})	3.21
Hardness (kg mm^{-2})	
Knoop (500 g load)	2540
Vickers (500 g load)	2500
Chemical Purity[2]	≥99.9995% SiC
Flexural Strength, (MPa/Ksi) 4-point[3]	
@ RT	415/60
@ 1400°C	575/84
Weibull Parameters	
Modulus, m	11
Scale Factor , ß (MPa/Ksi)	424/61
Fracture Toughness, K_{IC} Values	
Micro-indentation (MN $m^{-1.5}$)	3.3
Controlled Flow (MN $m^{-1.5}$)	2.7
Elastic Modulus	
Sonic (GPa/10^6 psi)	466/68
4-point Flexure (GPa/10^6 psi)	461/67
Coefficient of Thermal Expansion (K^{-1})	
@ RT	2.2 x 10^{-6}
@ RT to 1000˚C	4.0 x 10^{-6}
Heat Capacity(Jkg^{-1} K^{-1})	640
Poisson's Ratio	0.21
Polishability[4]	<3Å RMS
Thermal Conductivity (Wm^{-1} K^{-1})	
SC-001, SC-003	300
SC-002	285
Electrical Resistivity[5] (Ωcm)	
SC-002	<1
SC-003	>1000

(1) Average values at room temperature unless otherwise specified.
(2) Total metallic impurities; detailed data on specific impurities is available on request.
(3) Flexure beams had a 0.5 µm RMS surface finish.
(4) Polishability was measured with an optical profilometer.
(5) Measured according to ASTM standard.

Solid CVD SILICON CARBIDE is an ultra-pure material with superior thermal and physical properties that are a result of Advanced Materials' bulk chemical vapor deposition (CVD) process. All three grades of CVD SILICON CARBIDE excel in high performance applications that require high temperature (>1500 °C), wear, and chemical resistance performance. Two grades provide controlled electrical resistivity properties: SC-002 Low Resistivity Grade (<1 Ωcm) and SC-003 High Resistivity Grade (>1,000 Ωcm); while the resistivity is not specified in the third grade, SC-001 Standard Grade.

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ROHM AND HAAS

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