



CVD Silicon Carbide

Typical Properties

These properties are typical but do not constitute specifications.

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

⁽¹⁾ Average values at room temperature.

⁽²⁾ Total metallic impurities; detailed data on specific impurities is available upon request.

⁽³⁾ Flexure beams had a $0.5 \mu\text{m}$ RMS surface finish.

⁽⁴⁾ Polishability was measured with optical profilometer.

⁽⁵⁾ Measured according to ASTM standard.

High Temperature Property Retention

CVD SILICON CARBIDE is a high temperature material with a sublimation temperature of about 2700°C. In an inert environment, this material can be used up to a temperature of 1700°C. Above 1800°C there is an onset of phase change from cubic phase to hexagonal α -phase. As you can see in the table below, the material can be safely used up to a temperature of 1500°C with a good retention of thermal and mechanical properties.



We manufacture CVD SiC in two grades:

> Low Resistivity

> High Resistivity

To maximize the performance of your application, we also fabricate components in a wide range of shapes and sizes.

Using a combination of engineering expertise and manufacturing excellence, we offer quality SiC in a timely way that allows you to meet your production deadlines.

Let us know about your specific requirements, and we'll offer innovative solutions.



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