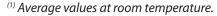


## **CVD Silicon Carbide**

<b>Typical Properties</b> These properties are typical but do not constitute specifications.	
Properties	Typical Values <sup>(1)</sup>
Crystal Structure (face-centered cubic ß-phase)	FCC polycrystalline
Sublimation Temperature (C)	~2700
Grain Size (μm)	5
Density (g cm <sup>-3</sup> )	3.21
Hardness (kg mm <sup>-2</sup> ) Knoop (500 g load) Vickers (500 g load)	2540 2500
Chemical Purity <sup>(2)</sup>	≥99.9995% SiC
Flexural Strength, 4-point <sup>(3)</sup> @ RT (MPa/Ksi) @ 1400°C (MPa/Ksi)	415/60 575/84
Weibull Parameters Modulus, m Scale Factor , ß (MPa/Ksi)	11 424/61
Fracture Toughness, K <sub>IC</sub> Values Micro-indentation (MN m <sup>-1.5</sup> ) Controlled Flow (MN m <sup>-1.5</sup> )	3.3 2.7
Elastic Modulus Sonic (GPa/10 <sup>6</sup> psi) 4-point Flexure (GPa/10 <sup>6</sup> psi)	466/68 461/67
Coefficient of Thermal Expansion (K <sup>-1</sup> ) @ RT @ RT to 1000°C	2.2 x 10-6 4.0 x 10-6
Heat Capacity (Jkg <sup>-1</sup> K <sup>-1</sup> )	640
Thermal Conductivity (Wm <sup>-1</sup> K <sup>-1</sup> )	300
Poisson's Ratio	0.21
Polishability <sup>(4)</sup>	<3Å RMS
Electrical Resistivity <sup>(5)</sup> Low Resistivity Grade High Resistivity Grade	<1 Ω cm >500 Ω cm



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

## **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  $^\infty\text{-phase}$ . As you can see in the table above, 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.

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<sup>(3)</sup> Flexure beams had a 0.5 μm RMS surface finish.

<sup>(4)</sup> Polishability was measured with optical profilometer.

<sup>(5)</sup> Measured according to ASTM standard.