

International Ceramic Engineering

Silicon Carbide Ceramics

Property Comparison*

Property	Ceramic Composition					
	<i>SiC 1</i> Silicon Carbide	<i>SiC 2</i> Silicon Carbide	<i>SiC 3</i> Silicon Carbide	<i>SiC 4</i> Silicon Carbide	<i>SiC 5</i> Silicon Carbide	<i>SiC 6</i> Silicon Carbide
<i>Grade</i>	CVD	CVD	Hot Pressing	Hot Pressing	Hot Pressing	Sintering
<i>Purity</i>	99.9995%	99.9995%	99.3%	98.5%	97%	95%
<i>Density (g/cc)</i>	3.20	3.20	3.15	3.20	3.17	3.2
<i>Mechanical</i>						
Flexural Strength (MPa) @ RT	375	375	380	634	448	400
Elastic Modulus (GPa)	440	440	400	450	405	430
Poisson's Ratio	0.17	0.17	0.17	0.17	0.17	0.17
Hardness HV(0.3) Kg/mm ²	2850	2850	2300	2300	2300	2600
Fracture Toughness (MPam ^{1/2})	3.1	3.1	2.5	4.3	4.1	4.3
Abrasive Wear Resistance Parameter**	1178	1178	947	1130	1201	1263
<i>Thermal</i>						
Thermal Expansion Coeff. 10 ⁻⁶ /°C; (RT - 1000 °C)	4.5	4.5	4.8	4.8	5.5	4.5
Thermal Conductivity (W/mK) @ 25 °C	200	200	115	115	60	120
Thermal Shock Parameter (°C)***	157	157	164	244	167	180
<i>Electrical</i>						
Electrical Resistivity (ohm-cm)	≈ 3 x 10 ³	10 ¹	10 ⁶	10 ⁷	10 ⁹	10 ⁶
<i>Applications</i>	Semiconductor Components, Wear Components	Semiconductor Components, Wear Components	Semiconductor Components, Sputtering Targets	Ballistic Armor, Sputtering Targets, Semiconductor Components, Wear Components	Semiconductor Components	Wear Components
<i>Key Features</i>	Purity >99.9995%, Corrosion Resistance, Wear Resistance, Near Net Shape Fabrication to 400 mm OD	Purity >99.9995%, Corrosion Resistance, Wear Resistance, Near Net Shape Fabrication to 400 mm OD	High Purity, Corrosion Resistance, Wear Resistance	Wear Resistance, Corrosion Resistance, Tailored Electrical Properties	Tailored Electrical Properties, Wear Resistance, Corrosion Resistance	Hardness, Wear Resistance, Corrosion Resistance, Net Shape Fabrication

* Property values are typical and should not be considered specifications.

** Abrasive Wear Resistance Parameter = Fracture Toughness^(0.5) * Hardness^(1.43) * Elastic Modulus^(-0.8)

*** Thermal Shock Parameter = [Strength * (1-Poisson's Ratio)] / (Elastic Modulus * Thermal Expansion Coeff.)

International Ceramic Engineering
235 Brooks Street
Worcester, MA 10606 USA
Phone (508) 853-4700
Fax (508) 852-4101
Website: www.intlceramics.com