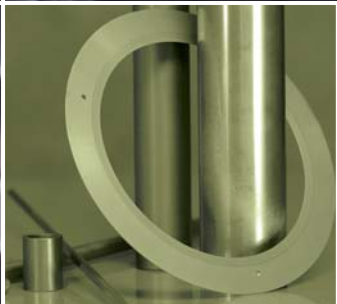


**COORSTEK**  
*Amazing Solutions:*



**SILICON CARBIDE**

## ADVANCED SILICON CARBIDE FOR CRITICAL COMPONENTS

### Pure SiC™ CVD Silicon Carbide

CoorsTek manufactures bulk SiC using a high-temperature Chemical Vapor Deposition (CVD) process. Ultra-pure raw materials and carefully controlled processing conditions create exceptionally clean, dense, and corrosion resistant SiC. Pure SiC can be manufactured to meet both high and low resistivity requirements.

- Purity greater than 99.9995%
- Excellent mechanical properties
- High thermal conductivity
- Superior corrosion resistance
- Near-net shape deposition
- Sizes up to 20"

### Reaction Bonded Silicon Carbide

CoorsTek employs a reaction-bonding process to manufacture SiC that retains approximately 10% free silicon. Our bonded SiC can be formed by casting, dry pressing, or isostatic pressing.

- Excellent wear properties
- Thermal shock resistance
- Sizes up to 20"

### Direct Sintered Silicon Carbide

CoorsTek produces high-purity SiC using a direct sintering process. This process allows for low-cost forming methods such as casting, dry pressing, and isostatic pressing, while retaining high-purity levels.

- Purity greater than 99%
- Thermal shock resistance
- Near-net shape forming
- Excellent mechanical properties
- Sizes up to 36" x 75"

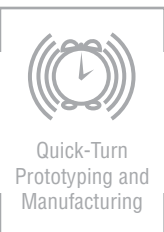
### Graphite Loaded Direct Sintered Silicon Carbide

CoorsTek has combined the lubricating properties of graphite into their already established high-purity sintered silicon carbide to create the next generation in friction and wear materials. This engineered material designated as SC-DSG offers the stability of sintered silicon carbide and the low frictional characteristics of graphite. This chemically inert combination can be formed utilizing the latest technologies of dry pressing, casting, and isostatic pressing.

- Excellent Thermal Shock Properties
- Excellent Chemical Resistance
- Near Net Shape Forming
- "Built-in" lubrication
- Sizes up to 20"

### Materials and Manufacturing Experts

CoorsTek is uniquely capable of providing advanced materials and manufacturing technologies. Let the CoorsTek team help you select the best materials and design for manufacturability. For expert engineering and design assistance, call CoorsTek at **800-821-6110**.



Property	Units	Test	SC-RB (SC-2)	SC-DS (SC-30)	SC-DSG (SC-35)	SC-DSL (SC-50)	Pure SiC™ (HR Grade)	Pure SiC™ (LR Grade)
			Reaction Bonded	Direct Sintered	Graphite Direct Sintered	Liquid Phase-Direct Sintered	High Resistivity CVD	Low Resistivity CVD
Density	gm/cc	ASTM-C 20	3.10	3.15	2.80	3.18	3.21	3.21
Crystal Size, Average	MICRONS	THIN-SECTION	12	5	5	8	3 - 10	3 - 10
Color	*	*	Black	Black	Black	Black	Black	Black
Flexural Strength (MOR), 20° C	MPa (psi X 10 <sup>3</sup> )	ASTM-F417	462 (67)	480 (70)	220 (21)	540 (78)	468 (68)	517 (75)
Elastic Modulus, 20° C	GPa (psi X 10 <sup>6</sup> )	ASTM-C848	393 (57)	410 (59)	310 (32)	375	462 (67)	434 (63)
Poisson's Ratio, 20° C	*	ASTM-C848	0.20	0.21	0.18	0.38	0.21	0.21
Compressive Strength, 20° C	MPa (psi X 10 <sup>3</sup> )	ASTM-C773	2700 (363)	3500 (507)	675 (91)	*	*	*
Hardness	GPa (kg/mm <sup>2</sup> )	KNOOP 1000 gm	26 (2500)	26 (2500)	26 (2500)	24	27 (2750)	27 (2750)
Tensile Strength, 25° C	MPa (psi X 10 <sup>3</sup> )	ACMA TEST #4	307 (44.5)	*	*	*	*	*
Fracture Toughness, K1c	MPa m <sup>1/2</sup>	Notched Beam	4	4	3.2	6.9	3.5	3.5
Thermal Conductivity, 20° C	W/m K	ASTM-C408	125	150	125	80	115	115
CTE, 25-1000° C	1X 10 <sup>-6</sup> /°C	ASTM-C372	4.3	4.4	4.4	3.3	4.6	4.6
Specific Heat, 100° C	J/kg*K	ASTM-E1269	820	800	820	820	665	665
Thermal Shock Resistance, ΔTc	°C	NOTE 3	400	300	600	300	*	*
Maximum Use Temperature	°C	NO-LOAD COND.	1000	1600	1600	1000	1600	1600
Volume Resistivity, 25° C	log (ohm-cm)	ASTM-D1829	< 10 <sup>6</sup>	< 10 <sup>6</sup>	< 10 <sup>6</sup>	*	> 10 <sup>6</sup>	< 0.1
Volume Resistivity, 500° C	log (ohm-cm)	ASTM-D1829	< 10 <sup>6</sup>	< 10 <sup>6</sup>	< 10 <sup>6</sup>	*	*	*
Volume Resistivity, 1000° C	log (ohm-cm)	ASTM-D1829	< 10 <sup>6</sup>	< 10 <sup>6</sup>	< 10 <sup>6</sup>	*	*	*

\* Not available

Note: The chart is intended to illustrate typical properties. Engineering data is representative. Property values vary somewhat with method of manufacture, size, and shape of part. This data is not to be construed as absolute and does not constitute a warranty for which we assume legal responsibility.

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