

INNOVATORS OF INDUSTRIAL CERAMIC PRODUCTS

REF-SIC™ SILICATE BONDED SILICON CARBIDE SHAPES

MATERIAL

- Silicate Bonded Silicon Carbide
 - Ref-SiC X01 – Standard Mix
 - Ref-SiC X02 – For Maximum Abrasion Resistance and ZnO Applications
 - Ref-SiC X03 – Incineration Tube Tile

APPLICATIONS AND USES

- Bins, Hoppers and Chutes
- Boilers and Burner Liners
- Chemical Reactor Vessels – Grid Support Beams
- Coal Fired Power Plants
- Copper Shaft Furnace Brick
- Exhauster Housings
- Gas Scrubber Liners
- Guides and Scrapers
- Incineration
- Kiln Furniture
- Large Custom Shaped Tiles, Tubes and Rails
- Muffle Furnace Arch Brick
- Pipes and Elbows
- Setter Tile
- Thermocouple Tubes
- Valves and Chokes

PROPERTIES

- Excellent resistance to abrasion
- Excellent resistance to corrosion
- Excellent resistance to thermal shock
- Can be formed into very large monolithic shapes
- Made to accurate dimensional tolerances
- Low expansion coefficient
- Excellent performance at high temperatures
- Silicon Carbide is one of the hardest materials known



ADVANTAGES

Provides a solution for many applications in industry where abrasion, corrosion or high thermal shock are a problem.

Enhanced performance improvement over materials such as steel, metallic alloys, weld overlays, rubber, plastics and other materials presently in use.

Ideal for complex industrial applications where large ceramic sections are required.

Can be made into both small and very large monolithic shapes where tight dimensional tolerances are required.

Expert application consultants are available at Christy to answer questions regarding the use of technical ceramics.

SILICATE BONDED SILICON CARBIDE

PROPERTY	UNITS	Ref SiC™		
		X01	X02	X03
Max Hot Face Temperature⁽¹⁾	°C °F	1649 3000	1593 2900	1427 2600
Modules of Rupture ASTM C133	MPa@20°C (psi at 70°F) MPa@1350°C (psi at 2460°F)	18.6/2700 18.6/2700	21.7/3150 9.9/1440	18.6/2700 5.0/720
Bulk Density ASTM C134	g/cm ³ lb/ft ³	2.55 159	2.58 160	2.53 158
Porosity ASTM C20	%	14.1	14.1	17.2
Hot-Loaded Contraction 50 hrs at 50 psi (3.5kg/cm ²) at 1500°C (2730°F) ASTM C546	% of length	0.0	1.1	2.2 25.psi
Thermal Expansion Coefficient (mean)	1/°C x 10 ⁻⁶ (20-1400°C) 1/°F x 10 ⁻⁶ (68-2552°F)	4.9 2.7	4.9 2.7	4.9 2.7
Thermal Conductivity ASTM C202 at mean temperature shown	W/m ² K at 1477°K BTU in/hr ft ² F at 2200°F	15.7 109	15.7 109	15.7 109
Specific Heat 0-1400°C (2550°F)	cal/gm°C	.28	.28	.28
Reheat Change ASTM C113 5 hrs at 3030°F		-----	-----	-----
Abrasion Resistance		Excellent	Excellent	Excellent
Spall Resistance		Excellent	Excellent	Excellent
Compressive Strength ASTM C133	MPa/psi	124/18000	124/18000	122/17750
Permeability at 25°C (70°F)	cm ³ /min of air flow for 1 in. H ₂ O press., 1 in ² area, 1 in thkns.	3.6	3.3	3.9
	% SiC	89.6	87.9	89.2
	SiO ₂	8.5	9.5	6.3
	Al ₂ O ₃	0.9	1.8	1.0
	Fe ₂ O ₃	0.7	0.7	1.0
Chemical Analysis Core Chemistry	CaO	—	—	—
	TiO ₂	—	—	—
	Na ₂ O	—	—	—
	Si ₃ N ₄	—	—	—
	OTHER	0.3	0.1	2.5

1) Maximum Hot Face Temperature is based on one face only, no loading, clean combustion gases.
All values shown above are typical and are not guaranteed or warranted.