



CFCCARBON CO., LTD

Anti-ablation C/C-ZrC properties

Product name: C/C-ZrC; Cf/ZrC/SiC

Structure Type: weave /sewn

Main application: anti-ablation (Combustion chamber, throat liner); heat protection material.

Processing type: C/C+SiC+CVD/RMI

Sheet No.01: Typical properties of C/C-ZrC material

No.	Item	Unit	Direction	Tested
1	Density	g/cm ³	--	2.1-3.1
2	Bending strength	MPa	XY	230-336
			Z	210-250
2	Compressive strength	MPa	XY	210-235
			Z	--
3	Tensile strength	Mpa	XY	121-172
			Z	130-150
4	C.T.E (1000°C)	10 ⁻⁶ /°C	XY	3.9-6.21
			Z	2.75-5.45
5	Thermal conductivity (900 °C)	W/(mK)	XY	12-27
			Z	10-25

(The relevant range is taken, which is affected by the content of ceramic phase, carbon fiber content and weaving method)

Sheet No.02: Mechanical properties of C/C-ZrC material

Items	Temp(°C) & directions	Average strength(MPa)	remarks
Tensile strength	RT, XY	152	
	1000°C, XY	225	
	1400°C, XY	256	
Bending strength	RT, XY	210	
	1000°C, XY	453.4	
	1400°C, XY	423	
Compressive strength	RT	403	
	1000°C	Overrange 400	
	1400°C	Overrange 400	



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Sheet No.03: C.T.E properties of C/C-ZrC material

Directions	items	Unit	results	remarks
	Average Linear Expansion Coefficient			
XY	25°C-100°C	(×10-6/°C)	-3.70	
	25°C-200°C		-0.07	
	25°C-300°C		1.13	
	25°C-500°C		1.23	
	25°C-700°C		1.64	
	25°C-900°C		3.06	
	25°C-1000°C		3.21	
	25°C-1100°C		3.14	
	25°C-1200°C		3.13	

Sheet No.04: Thermal conductivity, thermal diffusivity and specific heat capacity of C/C-ZrC matrix composites

Directions	Temperature (°C)	Thermal conductivity (W/m*K)	Thermal diffusivity (mm2/s)	Specific heat capacity (J/g/K)	remarks
XY	30	19.748	15.968	0.442	
	300.1	21.869	9.876	0.791	
	500.4	16.926	6.830	0.885	
	700.4	16.052	5.646	1.015	
	900.4	5.657	3.272	0.617	

Max size: W500-H1000-T100mm, or D500/300-H1000mm, other sizes to confirm!

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