

High heat resistance and high thermal conductivity carbon material

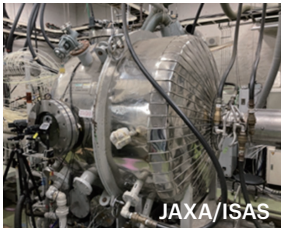
Fusion /
Aerospace

Product Overview & Key Features

【High heat resistance C/C&C/(Zr-Ti)C】

Leveraging the high heat resistance of C/C and C/(Zr-Ti)C based on pitch-based carbon fiber, we are exploring applications such as rocket nozzles and shield tiles.

*Test facilities: JAXA Arc-Heated Wind Tunnel and others



■2500 °C heat resistance C/ (Zr-Ti) C

	ZT80 (cross)	ZT80 (Felt)	ZT36 (Felt)
Medium heating rate			
High heating rate			

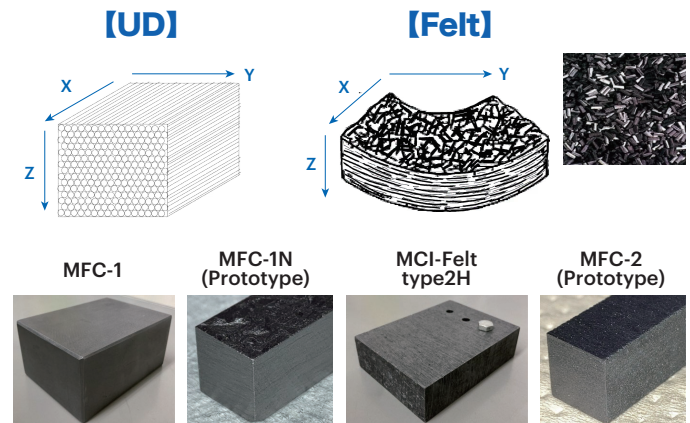
Joint development is underway with Tokyo University of Science. Arc-heated wind tunnel tests were conducted on pitch-based C/C composite substrates, as well as materials impregnated with Zr-Ti alloy. No delamination or similar issues were observed.

【High thermal conductivity C/C】

Leveraging the “High Thermal Conductivity” of pitch-based carbon fiber, we are exploring applications in fusion-related fields.

C/C type		High Thermal Conductivity				Normal
Fiber arrangement		UD		Felt		Felt
Product name		MFC-1	MFC-1N (Prototype)	MCI-Felt type2H	MFC-2 (Prototype)	Felt
Bulk density (g/cm ³)		>1.9	>1.9	>1.9	>1.9	>1.9
Thermal conductivity (W/m·K)	X	550	520	340	370	70
	Y	40	30	340	370	70
	Z	40	30	60	60	12

*The values listed here are representative and may vary depending on the laminate structure and the amount of contained substances.

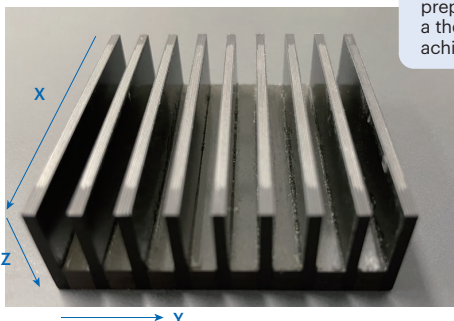


[Manufacturable Size]: Negotiable 210 × 150 × 110 mm

【Graphite sheet】

With a thickness of 100 μm or more, high thermal conductivity and high density are achieved.

Applications under consideration include satellites, space communication antennas, optoelectronic semiconductor lasers, and laser fusion.



By alternately laminating 120 μm graphite sheets and 180 μm pitch-based carbon fiber (K13916) / cyanate (#290) resin prepreps in the X and Z directions, a thermal conductivity of 700 W/m·K was achieved.

By combining material weight reduction with high thermal conductivity for a thinner design, aluminum heat-dissipation plates weighing over 20 kg can be reduced to less than 4 kg.
→ The effect of suppressing heat generation in antenna elements was experimentally verified using composite heat-dissipation plates that leverage the high thermal conductivity of graphite sheets.



Aluminum heat sink plate



Graphite sheets and high-thermal-conductivity CFRP sink plate