

S-CMC[®]

Super-Cu Mo Cu

Creating the Future
FJ Composite

“Supreme Heat Sink Material”

Our heat sink material is composed of a multilayer structure of copper and molybdenum foils. With our innovative manufacturing technology, our product achieves higher thermal conductivity while maintaining a low coefficient of thermal expansion. It finds applications in a wide range of fields, including semiconductors.



Characteristics

Mass production System

Precision machining using Wire Electrical Discharge Machining (Wire EDM) and full automation with robots

Low production cost

- Lower molybdenum content with the same performance compared to the competitor products.
- Complete automation from material preparation to inspection and packaging

Various shape processing technologies

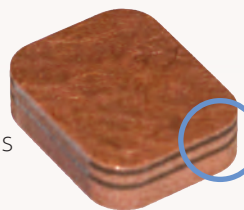
With CNC machining and Wire EDM, our S-CMC material can be processed to your specification.

No adhesive materials for bonding

Using a hot press apparatus, copper and molybdenum foils are directly joined through diffusion bonding.

Various laminated structures

- Our product has a molybdenum content of 1/5 to 1/10 compared to other companies' products, making it more cost-effective.
- Our technology allows for adjusting the thickness of the product in increments of 7.5 micrometers.
- Various shape machining is possible.



Unique Selling Point

- The special award at the 6th innovation Japan Award sponsored by Japanese Ministry of Economy, Trade and Industry.
- Patents obtained in Japan, USA, EU, China





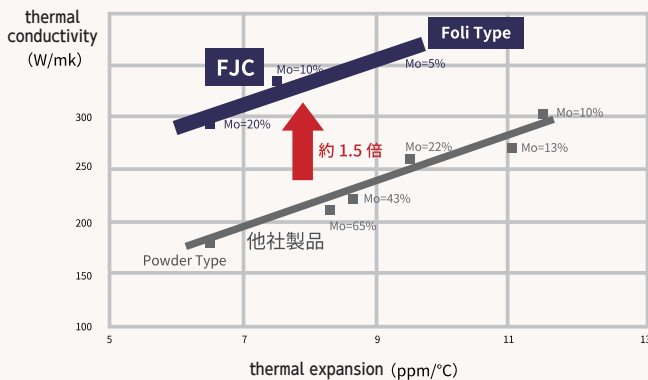
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Physical properties

High thermal conductivity and low thermal expansion



Typical Properties		Super-CMC				Ref.
MoContent (%)		Mo=5%	Mo=10%	Mo=20%	Mo=40%	Cu=100%
Thermal conductivity (W/mk)	Z-direction	362	335	291	230	394
	XY-direction	381	369	344	290	394
Thermal Expansion ($\times 10^{-6}/^{\circ}\text{C}$)	RT-250°C	14.8	11.8	7.4	6.6	17
	RT-400°C	13.5	9.3	6.8	6.2	
	RT-800°C	9.5	7.5	6.5	6.1	

Comparing FJC products with the competitor's

Our product has 1.5 times the thermal conductivity compared to other company's products, while maintaining a low coefficient of thermal expansion ranging from 6 to 10 PPM/°C.

The values of thermal conductivity and coefficient of thermal expansion in various molybdenum contents

The copper-to-molybdenum ratio can be adjusted to your desired value.

Applications

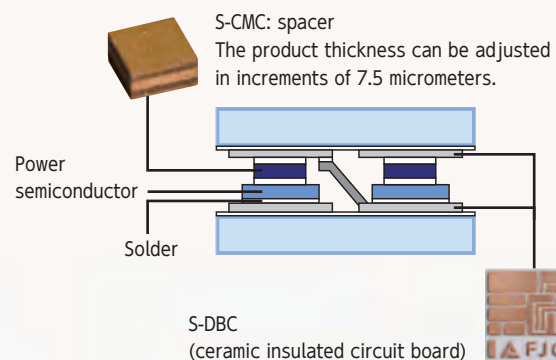
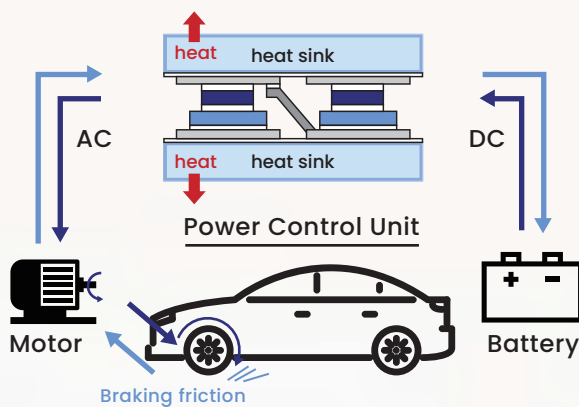


Mass production System

Low production cost

Power Control Unit (PCU) for battery electric vehicles

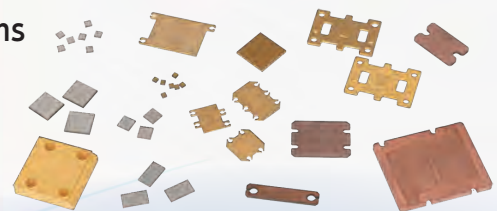
- S-CMC plates are employed as spacers to bridge the gap between power semiconductors and circuit boards, and they play a role in heat conduction.
- An ideal heat sink material for double-sided cooling PCUs with extremely small thickness variation.



Various shape processing technologies

5G mobile communications

- Our product is utilized in the 5G communication equipment, mobile phone base stations, and airplane Wi-Fi systems.
- The product is employed as a high-performance heat sink for semiconductor packages used in high-frequency bands. It provides excellent thermal conductivity.



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