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NEWS RELEASE

New Copper Sinter Material Enables Large-Area bonding for Power Module

～Enhancing Thermal Performance and Reliability in Power Modules through Low-Load Bonding～

Mitsui Kinzoku Company, Limited (President: Seiji Ikenobu; hereinafter "Mitsui Kinzoku") hereby announces that it has developed a novel copper sinter material designed for large-area bonding applications in heat dissipation components of power modules. This development was achieved by the Advanced Sinter Technology (AST) Business Development Unit within the Company's Business Creation Sector.

In recent years, power modules—particularly those used in automotive applications—have continued to evolve toward higher output and greater efficiency. As a result, further enhancement of thermal management performance has become increasingly critical. Accordingly, materials used for bonding and heat dissipation components are required to offer not only superior thermal conductivity but also exceptional reliability.

Conventional solutions have presented notable challenges: silver sinter materials impose significant cost burdens, while solder materials face limitations in thermal performance and long-term reliability. These constraints have hindered their applicability in next-generation high-performance systems. Furthermore, in large-area bonding applications, thermal expansion mismatches generate elevated stress levels, increasing the risk of deformation and damage. This has driven growing demand for low-load bonding technologies capable of mitigating such risks.

The newly developed copper sinter material leverages Mitsui Kinzoku's proprietary particle design and paste formulation technologies. It enables large-area bonding under relatively mild conditions—230°C and 10 MPa—while effectively suppressing the formation of voids. In addition to its cost advantage, the material achieves an optimal balance between high thermal conductivity and excellent reliability. It is currently undergoing evaluation by more than 20 companies both in Japan and internationally, demonstrating strong market interest.

This technology will be introduced as a heatsink attachment solution within the Cuprima series of copper sinter materials for power semiconductors, complementing existing die-attach products in the same lineup. Looking ahead, the innovation is expected to contribute significantly to improving the performance and energy

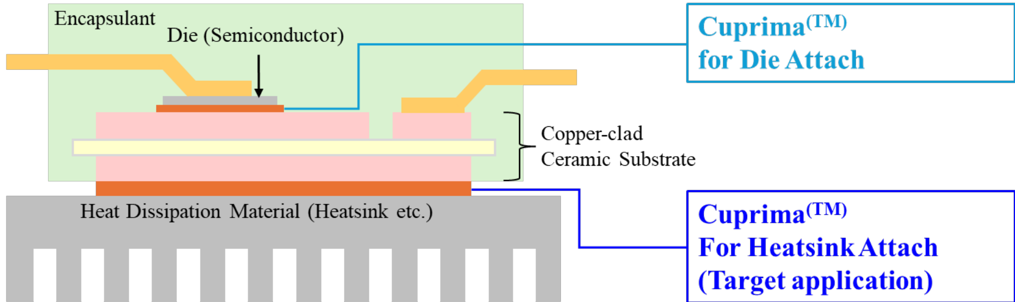
efficiency of power modules, while also supporting energy conservation and environmental sustainability across the power electronics sector. Mitsui Kinzoku will present the results of this development and provide further information on the Cuprima series at PCIM Europe 2026, to be held in Germany in June 2026.

* Cuprima is a coined term derived from "cuprum" (copper) and "primus/prima" (best) in Latin.

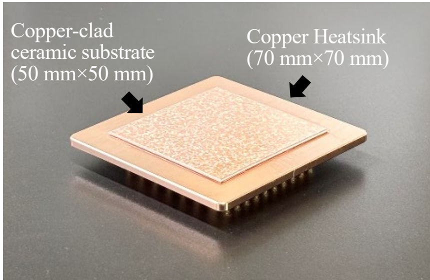
Guided by its corporate purpose, “We promote the well-being of the world through a spirit of exploration and diverse technologies,” Mitsui Kinzoku will continue to pursue its 2030 Vision of becoming a company that creates new businesses through the intelligent use of materials, thereby contributing to the realization of a sustainable society.

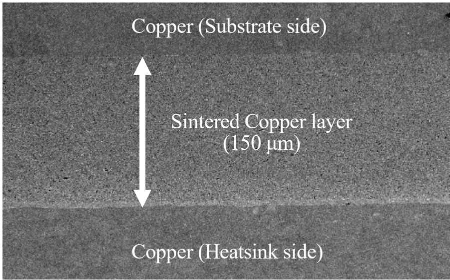
[Reference]

Cross-sectional schematic of a power module with heat dissipation components



Bonded sample (left) and cross-sectional electron microscope image (right)





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