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NEWS RELEASE

Development of Thin-Film TaC Coating Technology for Graphite Components Using iconos™

**—Aiming to Extend the Service Life of Complex-Shaped Components Used in Semiconductor
Crystal Growth Equipment and Other Applications Through Thin-Film Interface Control—**

Mitsui Kinzoku Company, Limited (President: Seiji Ikenobu; “Mitsui Kinzoku”) announces that it has developed a thin-film coating technology utilizing its “iconos™” series of rare metal solution materials for TaC (tantalum carbide) coatings. The technology can be applied to graphite components with complex shapes featuring grooves, holes, and irregularities.

As announced in our [April 26, 2024 press release titled “New iconos™ Line of Minor Metal Solution Materials Developed”](#), we developed the “iconos™” series of solution materials for rare metals, including Ta and Nb, and have been expanding their applications by leveraging the ease of handling offered by liquid materials, including ease of mixing and application, as well as their high reactivity. Furthermore, as announced in our January 7, 2025 press release titled “Establishment of the Functional Liquid Commercialization Promotion Department,” we established a framework to promote the commercialization of functional liquids and are accelerating expansion into new applications and businesses, including coatings.

In semiconductor crystal growth equipment, graphite components such as susceptors, heaters, crucibles, and porous plates are used in high-temperature, reactive atmospheres; therefore, it is necessary to protect the graphite surface with TaC to improve durability. While the CVD method is generally used to form TaC coatings, it is difficult to form a uniform, tightly adherent coating over the entire surface of complex-shaped components, posing challenges in terms of lead times and costs.

By combining iconos™ with its proprietary coating technology, Mitsui Kinzoku has developed a coating technology that provides excellent adhesion on a variety of complex-shaped graphite components. The process enables the formation of a thin, dense TaC coating by allowing the liquid material to react uniformly on the surface of the graphite substrate.

The main features are as follows:

- The TaC coating helps suppress degradation of the graphite substrate
- Simplified processes enable shorter lead times compared to the CVD method
- Interface design using a thin film reduces the risk of delamination
- Leveraging the ease of application of liquid materials, the coating can be applied to complex-shaped

graphite components where uniform film formation is difficult

Going forward, we will expand the application of this technology to components used in semiconductor manufacturing processes, such as susceptors, heaters, crucibles, and porous plates.

Mitsui Kinzoku will contribute to the realization of a sustainable society by implementing its vision for 2030, “Building new businesses —and the future— with our material intelligence,” based on its purpose, “We promote the well-being of the world through a spirit of exploration and diverse technologies.”

(For Reference)

Example of the appearance of a TaC-coated graphite susceptor



Uncoated



Coated with TaC

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