Note: The original disclosure in Japanese was released on November 20, 2023 at 15:00. (GMT +9).

News Release Dated November 20, 2023

Company name: JCU CORPORATION
Representative: Masashi Kimura, Chairman & CEO

JCU quickens development of surface treatment chemicals for next-generation semiconductors and launches new brand

Forming fine wiring of 2μm or less and contributing to digital society through autonomous driving and generative AI

JCU Corporation (Chairman & CEO: Masashi Kimura) has launched TIPHARES, a new brand of surface treatment chemicals for semiconductors, and is following a proactive strategy towards mass production with the full-scale manufacture of next-generation semiconductors. As a first step, we will launch TIPHARES RDP, a copper plating chemical for rewiring layers, and TIPHARES TCE, a titanium (Ti)/copper (Cu) sputter seed layer batch etching chemical, which are surface treatment chemicals for the back-end processes of high-density wiring connections between semiconductor chips. These chemicals are used to form wiring for circuit patterns with a uniform height of 2μm (μ = one millionth; 2μm = 2/1000 mm) or less, which are necessary for the back-end process of next-generation semiconductor manufacturing. In addition to the back-end process, we will launch surface treatment chemicals for through-silicon vias (TSVs) and mega-pillars (vertical connection electrodes) required for next-generation semiconductors from April 2024 and will also continue joint research with Tohoku University to develop chemicals for hybrid bonding. These initiatives will enable high-speed semiconductor processing and power savings, contributing to the development of a digital society that includes autonomous driving and generative AI. We aim to achieve sales of 1 billion yen under the TIPHARES brand in the fiscal year ending March 31, 2027.

As a leading manufacturer of surface treatment chemicals, JCU has supported the miniaturization and performance enhancement of smartphones, tablets, and personal computers with surface treatment chemicals for printed circuit boards and semiconductor packaging substrates. The chemicals for these substrates account for around 55% of total chemical sales. Based on our knowledge and achievements gained in the substrate field, we are undertaking full-scale development of surface treatment chemicals for semiconductors.

Semiconductor packages with multilayer circuits have connection areas known as vias to electrically connect lower-layer wiring to upper-layer wiring. Via holes are formed by opening holes in the interlayer insulating film and filling them with metal material. In the wiring formation technique known as the semi-additive method, copper plating chemicals are used to form fine wiring and simultaneously fill the via holes with copper. RDP, a copper plating chemical for rewiring layers, is a product targeting wiring formation in the back-end process that exhibits excellent via filling (embedding) properties and high film thickness uniformity even with a small surface plating film thickness. The manufacture of next-generation semiconductors requires "RDL interposers," which are relay components that electrically connect multiple semiconductor chips to semiconductor package substrates, and we consider RDP surface treatment technology to be essential for these components.

The Kumamoto Office (tentative name), which is scheduled to be completed in the fiscal year ending March 31, 2026, will be equipped with a clean room for the development and manufacture of TIPHARES brand products, and there are plans to introduce dedicated equipment for evaluating products under development. This will accelerate the development of high value-added products targeting the semiconductor field.

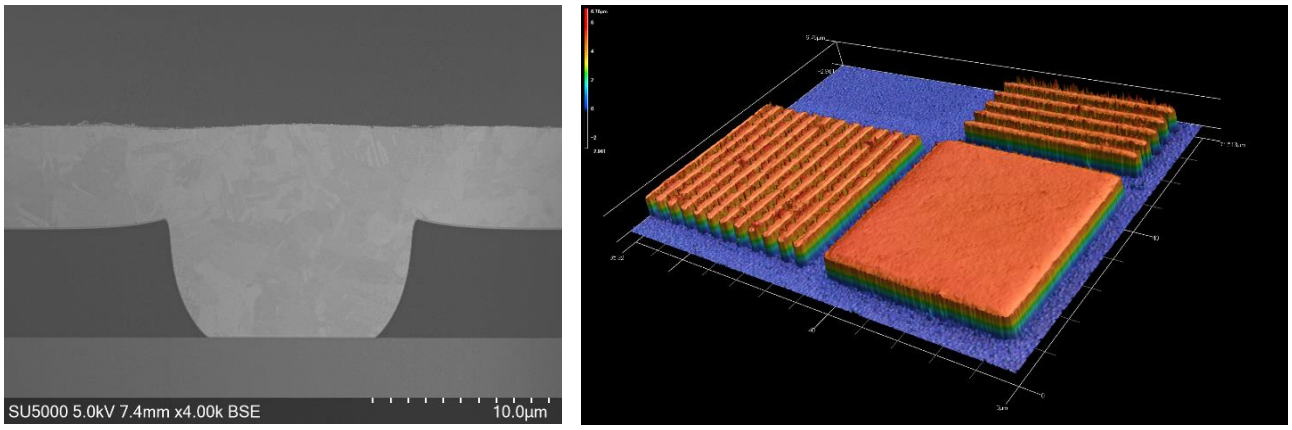

Photo: Cross section after plating with TIPHARES RDP (left). The copper is filled and displays excellent filling (embedding) properties. In the 3D photograph (right), all plated areas are shown in the same orange color because the plating film thickness is uniform regardless of the circuit pattern.

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