NEWS RELEASE

Mitsui Mining & Smelting Co., Ltd.
1-11-1 Osaki, Shinagawa-ku, Tokyo 141-8584

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Mitsui Kinzoku develops ultra-thin copper foil with superior flexibility

-- New 9-µm S-HTE expands lineup of products for FPCs --

Mitsui Mining & Smelting Co., Ltd. (Mitsui Kinzoku) has recently developed an electrodeposited copper foil product (Note 1) that exhibits greater bending strength and low springback after bending. This new product, sold under the name S-HTE, is the first copper foil in the world to be developed at a mere 9 micrometers (µm) in thickness.

Mass production of S-HTE has already begun at the Company's Ageo Copper Foil Plant near Tokyo, and the shipment of samples has commenced.

S-HTE foil: extreme thinness and high flexibility

Mitsui Kinzoku's S-HTE electrodeposited copper foil product is specially designed to form a flexible crystalline structure when subjected to heat-processing at user plants. The newly developed 9µm version is the result of efforts to marry fine-etching capability with high flexibility, and the product's main applications are expected to be flexible printed circuits (FPCs), whose thinness and flexibility are essential for the realization of compactness and light weight in digital electronic appliances.

Copper foils currently employed for the folding or bending parts of an FPC are usually

12μm in thickness, and the development of the 9-μm-type S-HTE will allow makers of electronic devices to further increase device compactness, or to put extra functions into the same space. In the field of cellular phones, for example, products are becoming increasingly sophisticated, and require a high level of component flexibility within an extremely limited volume. Users are demanding greater flexibility together with high-level reliability.

Compared with the double-face, flat and smooth electrodeposited copper foil products currently employed for FPCs, S-HTE shows low springback (after bending), and has more than twice the strength of conventional DFF (Dual Flat Foil) in the case of 360-degree flexure. It is thus ideal for products that demand compactness, such as cellphones.

FPCs are also used for the sliding parts of cellular phones. According to an analysis using an MIT folding endurance tester (Note 2), S-HTE has a folding endurance approximately twice that of conventional DFF (Dual Flat Foil).

Mitsui Kinzoku's special electrodeposited copper foils, and market developments

Many of the Company's special electrodeposited copper foil products are used as wiring materials for FPCs because of their fine patterning and superior flexibility. At present, demand is continuing to grow for copper foil products with a thickness of 12-18μm and a width of one meter or more, which are the mainline types, particularly for use in FPCs.

FPCs are widely employed in digital electronic equipment such as cellphones, cameras, audio players, and video game consoles, as well as in components such as LCDs and PDPs, where light weight and thinness or compactness are vital requirements. Demand for such applications is forecast to continue rising.

Production system for 9μm S-HTE and future plans

Mitsui Kinzoku already mass produces VLP (very low profile) and DFF (Dual Flat Foil) in 9μm, and now with the addition of the 9μm S-HTE (super high-temperature-elongation) product, we are able to offer users three types of 9μm foils, each with its own unique properties. This lets us meet user needs with a high degree of precision across a wide range of applications.

At our copper foil plant in Ageo, near Tokyo, we have constructed a production line

with a monthly output capacity of 500,000 square meters of 9µm copper foil. As in the case of 12-18µ foil, this foil can be produced in widths of one meter, and our system guarantees high product quality and reliable supply. Samples of our newly developed S-HTE 9µm foil are already being shipped to customers.

We are now turning our attention to the development of copper foils with special properties for high-performance applications, including a commercial product based on our patented MicroThin™ technology for the production of foil-on-carrier, which will make ultra-thin copper foil of 1-5µm possible. We will also focus on stable operation of our new production lines.

Note 1: Mitsui Kinzoku's lineup of electrodeposited copper foil products comprises customized surface-treated versions of our main brands – S-HTE, VLP, and DFF – to meet users' precise circuit requirements, thereby assuring product optimization for a wide range of applications. The lineup includes several dozen different types.

Note 2: Sample foils are folded many times under specified tensile strength testing conditions. The ability to withstand a specified number of foldings is employed for folding endurance.