



NEWS RELEASE

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

October 27, 2009

## Mitsui Kinzoku Further Increases Production Capacity for Ultra-Thin Electrodeposited Copper Foil with Carrier

Production planned of 1,000,000 m<sup>2</sup> per month of 1.0- to 5.0-micrometer  
ultra-thin copper foil for IC package substrates

Mitsui Mining and Smelting Co., Ltd. (Mitsui Kinzoku) has recently decided to increase its production capacity for MicroThin™ Series ultra-thin copper carrier foil for IC package substrates from 600,000 m<sup>2</sup> per month to 1,000,000 per month. Work on the required additional facilities was commenced in October.

### **Background to increase in MicroThin™ production, and demand developments**

The Company's ultra-thin copper foil "MicroThin™ Series" is superior to existing copper foil products in terms of forming fine-pitch circuits, and is increasingly being adopted by IC package substrate manufacturers to enable the creation of increasingly miniaturized circuits. Our products are penetrating the South Korean, Taiwanese and Chinese markets, to say nothing of Japan.

In response to demand for even higher performance, high-end mobile devices such as 3G cell phones, smartphones, multimedia cell phones, portable multimedia players, and netbooks are shifting toward printed circuit boards with even finer pitch, and the MicroThin™ Series is expected to find applications in a broader range of products.

To meet this strong demand, earlier this year the Company had been working to raise its production capacity from 450,000 m<sup>2</sup> per month to 600,000 m<sup>2</sup> per month, and this project was completed at the end of July this year. Since then, however, the market has continued to expand rapidly, and the management determined that in order to meet this increased demand it would be necessary to further increase capacity to 1,000,000 m<sup>2</sup> as soon as possible. Work on the additional production facilities commenced in October, with completion scheduled for July 2010. Production at 1 million m<sup>2</sup> should begin as soon as sample shipments have been certified as meeting customers'

specifications. These additional production facilities will enable us not only to handle the increased market demand for these products, but also to speed up the process of commercialization of newly developed products and new applications for ultra-thin copper foil.

### **MicroThin™ Series**

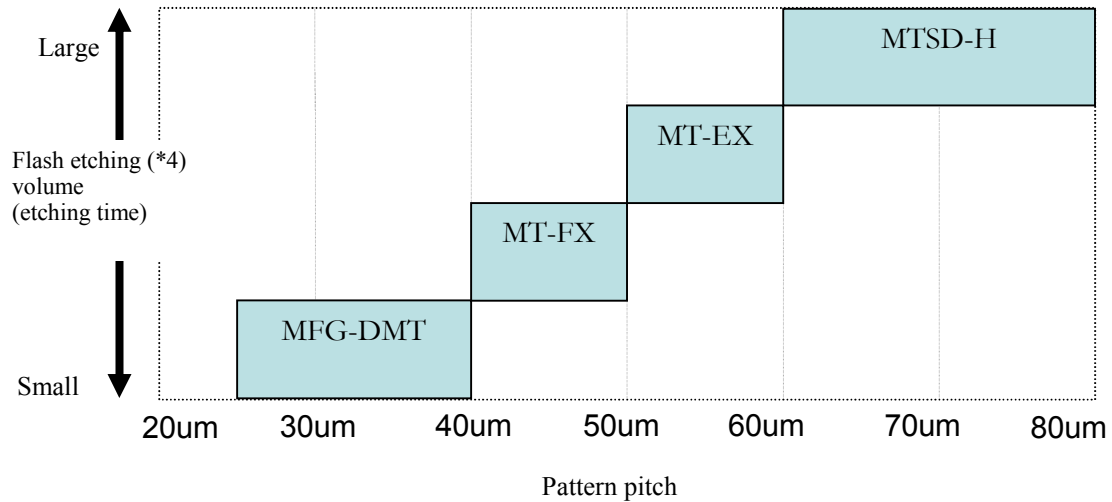
The MicroThin™ Series is ultra-thin copper foil with an 18-micrometer copper carrier foil. The thickness of the foil itself is as little as 1-5 micrometers, but the additional 18-micrometer carrier makes the foil as easy to handle as conventional copper foil.

The series is composed of two product lines for products with a circuit pitch of 50 micrometers or more, which differ in roughness (\*1): MTSD-H and MT-EX. Each line covers five different thicknesses of 1.0, 1.5, 2.0, 3.0 and 5.0 micrometers. The series thus supports a wide range of width up to 1,300 mm.

Development of the low-roughness MT-FX model and non-roughened (\*2) Multi Foil®-G (MFG) model has been completed. Characterized by its uniformly and finely roughened surface, the MT-FX can be produced in high yields with a circuit pitch of less than 50 micrometers by further shortening the etching time. The MFG is a profile-free (\*3) ultra-thin copper foil with an adhesive layer. Full-scale production is planned from 2010.

Additionally, the copper carrier foil layer can be separated at 300°C, and we expect to receive customer certification by the year-end for the application of this process to the production of high-end packages and leading-edge flexible printed circuit boards, where high-temperature processing is required.

Examples of application of MicroThin™ Series in MSAP (pattern plating method)



In this way, the MicroThin™ Series enables reliable adhesion to various types of substrate, and through various combinations of low-roughness and non-roughened types, finer pitches are made possible. Thus, the MicroThin™ Series earns high marks from a wide range of users, particularly makers of cutting-edge IC packages, as a strategic solution for pattern pitch reduction.

**Future developments**

The Company, as the leading manufacturer of copper foil in Japan, intends to utilize its 1 million m<sup>2</sup> per month production capacity for ultra-thin copper carrier foil products in the MicroThin™ Series to support the rapid expansion of high-performance IC package substrate products. We expect that this new, expanded production system, which will give us a significant lead over our competitors, will not only ensure the reliability of our product supply, but also enable us to further accelerate the process of new product development and commercialization.

Going forward, the Company will work to expand its array of state-of-the-art copper foil products, to enable swift response to diverse market needs and help us meet customer expectations.

**\*1: Roughness**

As used here, roughness refers to surface roughness; the lower this value, the easier to etch and the more suited to pitch reduction

**\*2: Non-roughened**

State in which the copper foil undergoes no roughening process

\*3: Profile-free

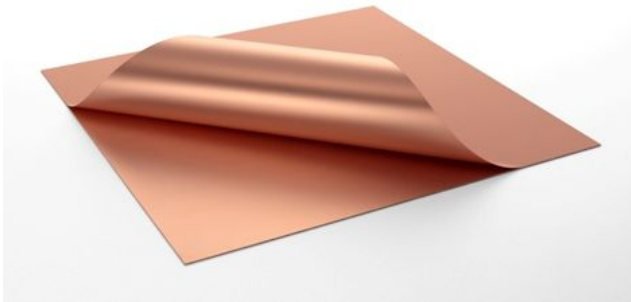
State in which the roughness level is extremely low

For example, copper foil with its smooth surface unroughened is described as profile-free.

\*4: Flash etching

Etching for removing the seed layer in the semi-additive process (SAP)

In the modified SAP in which the MicroThin™ Series is used like a seed layer, it is replaced by the process of etching the MicroThin™ Series excluding the part where pattern plating was applied. The process is called flash etching or strobe etching because of the short etching time and small etching volume.



Photograph of a MicroThin™ product

The upper, peeled-back portion is the carrier copper foil (18 micrometers).

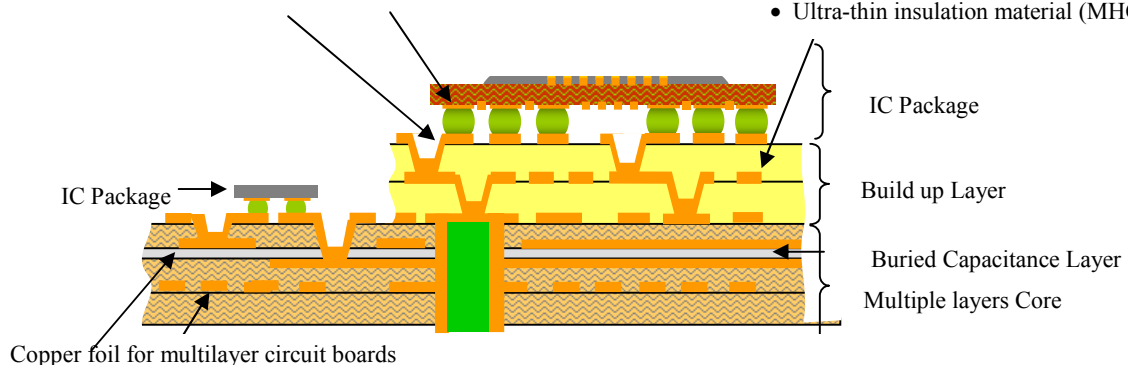
The lower portion is the ultra-thin copper foil (1-5 micrometers).

Copper foil for fine patterning

- Low-profile electrodeposited copper foil (VLP Series [7-35 micrometers])
- Ultra-thin copper foil with carrier (MicroThin™ Series [1-5 micrometers])
- Profile-free copper foil (MFG Series [1-5 micrometers])

Copper foil with resin

- Copper foil with eco-friendly synthetic resin (MRG Series)
- Ultra-thin insulation material (MHCG100 Series)



Copper foil for multilayer circuit boards

- High-precision copper foil (S-HTE Series [9-35 micrometers])
- Lower transmission-loss copper foil (VLP Series [7-35 micrometers])
- Materials for circuit board with internal capacitor (FaradFlex)

Examples of applications of copper foil to IC packages