



## Q&A Summary Concerning FY2019 Q2 Results

Reference: FY2019 Q2 Results & FY2019 Forecast

Note:

PKG = Package substrate

HDI = High density interconnect—a printed circuit board with a high wiring density that serves as a motherboard.

Subtractive method = A circuit fabrication technique that uses a general copper foil.

MSAP = Modified semi-additive processing—a circuit fabrication technique that uses our MicroThin™ product (ultra-thin copper foil).

L/S = Line width & space—describes how fine and how densely spaced together the wire lines of a printed circuit board are.

### **General Performance**

Q.

*Mitsui Kinzoku seems to run a greater range of businesses than enterprises dealing in non-ferrous materials do. These other enterprises seem to be leaning toward a concentration strategy, selling off businesses with mediocre performance. Are you heading this way, too? Are you going to concentrate your resources on growing, say, your engineered materials business?*

A.

Yes. On the one hand, we started pursuing a diversification strategy during the 2016 Mid-Term Management Plan period, leading to a range of new investments. We have, for example, engaged in corporate venture capital and invested in solid electrolytes and gasoline particulate filter technology. But in some areas, we have gone for a concentration strategy, replacing product lines and redistributing resources. I can't yet say what product lines we will concentrate on, but watch this space.

### **Engineered Materials Segment**

Q.

*You expected to see a growing number of customers for MicroThin™ in the HDI market, yet the uptake has fallen short of expectations. How are HDI-related sales of MicroThin™ doing this year, and what about the customers who held back on using the product?*

A.

The reason for the slow uptake is related to the fabrication technique that uses MicroThin™, MSAP. MSAP beats all other methods when it comes to boards with an L/S of under 30/30 micron, but it seems that customers are just on the cusp of going below this threshold.

A South Korean customer has decided to use the subtractive method for one of its two mainstay models. For the other model, the company is considering MSAP. Both models have an L/S of around 30/30 micron, so we're not sure which way the client will go. There are also two large Chinese manufacturers that might go with MSAP. One of the manufacturers is thinking about adopting the technique in its two models, but has made no firm commitment as yet. The other company, likewise, is still exploring the possibility.

Sales to the customers are currently only half of what we initially anticipated. Regarding the contributing factors, almost half of the shortfall is attributable to the fewer number of layers; around 20 percent of it is attributable to delayed uptakes by South Korean and Chinese manufacturers; around 10 percent is attributable to falling smartphone sales; around 10 percent is attributable to clients streamlining their production systems; and around 9 percent is from Japanese competitors.



Next year, a North American manufacturer will release 5G smartphones. We heard from the company that it will increase the amount of MicroThin™ it uses in the HDI such that the product makes up 25 to 30 percent more of the board surface. Apparently, the HDI for next year has an L/S of 30/30 micron, but in the year after that, it will be 25/25 micron.

Q.

*L/S 25/25 micron in the year after next? That seems doubtful. Contrary to your initial expectations, customers just don't seem to be going for smaller L/S ranges. Also, in North America, MicroThin™ is being used in fewer circuit board layers.*

A.

The reason we're not yet seeing uptake at finer ranges is because customers are reducing the number of motherboard layers where MicroThin™ is used. They have tried to maximize the motherboard's performance at minimal total cost. However, as they shift to 5G, they will need to use more components and finer circuitry. North American manufacturers will increasingly go for the 25/25 micron level. MicroThin™ is already optimized for this level, and clients have favorably evaluated its performance. I'm confident that manufacturers will use the product when 5G kicks in.

Q.

*You mentioned that a North American manufacturer will, next year, increase the board area for MicroThin™ to between 25 and 30 percent. Why the increase?*

A.

The increase is not because of finer circuitry. The manufacturer is still going for an L/S of 30/30 micron. The main reason is that the motherboard itself will be bigger, resulting in a larger board area. A larger motherboard means that a single piece of MicroThin™ will cover fewer motherboard layers, but this will actually result in more of the product being used. It's hard to explain without showing you the circuits of a smartphone.

Q.

*During yesterday's teleconference, you mentioned that a South Korean smartphone maker held back from using MicroThin™ in its HDI. You claimed that it did so because of the risk associated with using a Japanese supplier amid the current trade dispute. Will the company start using the product in the future?*

A.

Because of the pressure to avoid using a Japanese product such as MicroThin™, the user in question is prepared to adopt the subtractive method, even though it knows this would be far from ideal. Whether or not the user will ultimately adopt a non-Japanese product will depend on how favorably it evaluates the alternative. We'll have to wait and see.

Q.

*MicroThin™ now has some competition in the HDI market. Why is that? Also, what will next year's pricing be like?*

A.

The reason rival products have entered this arena is probably because client doesn't want a single supplier monopolizing the market. As for pricing, although MicroThin™ is no longer the only show in town, we will retain our existing price levels.

Q.

*High-end general copper foil seems to be doing well. Why is that? And what is the outlook for*

*next year and beyond?*

A.

In both 2018 and 2019, high-end general copper foil performed very well thanks to a surge in sales related to communications infrastructure. Performance at the middle-end range is excellent, too. Our plants in Taiwan and Malaysia are producing at full capacity. From what our clients in the communications infrastructure tell us, business in this sector will stay brisk for the time being.

Q.

*So high-end copper foil is performing well in the 5G market. At what scale of output is your Malaysian plant producing MicroThin™ relative to other products? Also, what is your production strategy going forward? For example, are you using any excess capacity to make an early start in producing MicroThin™ for PKG ?*

A.

Regarding general copper foil for communications infrastructure, both the Malaysian and Taiwanese plant are mostly at full capacity, and the former covers any shortfalls in latter's capacity. As for MicroThin™ though, actual output represents only around 20 percent of capacity.

We have responded to the excess capacity in two ways. First, to save production costs, we launched a carrier foil with a reduced size of 12 micron, compared to the previous size of 18 micron. Second, we geared up the Malaysian plant to produce a stable line of MicroThin™ for PKG , as we're confident that we'll see growth in this area. Some clients have already authorized the product.

Q.

*Are there any new developments in all-solid-state battery (ASSB) products? Can you give us any more details, such as schedules and volumes?*

A.

Regarding automotive applications, we have upped capacity from 40 to 150 kilograms output a month. We are also designing a pilot plant. The design should be completed by the end of November, at which time we'll review progress and decide whether to go ahead with building the pilot plant. One new development is that Maxell has taken up our solid electrolytes for high-vacuum, high-temperature, and ultra-low temperature environments. The battery maker has started shipping samples of ASSBs that use our electrolytes. Reviews are positive, and mass production should start next year.

Q.

*Are your facilities capable of supplying Maxell?*

A.

Yes. The batteries in question are button cells designed for wearable tech. Our facilities can handle the production. The contribution to revenue will be modest; the real impact will lie in the fact that sulfide solid electrolytes are entering mass production.

Q.

*You said you were eyeing a possible restructuring of your ITO sputtering targets business. Could update us on how you intend to proceed?*

A.

The LCD panel makers in Taiwan and South Korea whom we supply are facing changing



circumstances. They are losing out to Chinese competitors, which have built large production centers and have cornered the market. By the end of March next year, we will channel our strengths and work efficiently on producing a restructuring plan detailing how we intend to take the business forward.

Q.

*You said you would scale back capital expenditure on engineered materials. Can you give us more details?*

A.

The main change is that we're postponing production of our atomized copper powder line in Shimonoseki. We're also cutting spending on PVD materials. On the other hand, we're not cutting R&D spending.