Material for the Explanation Meeting on the Engineered Materials Business

We promote the well-being of the world
through a spirit of exploration
and diverse technologies.

January 9, 2025

Engineered Materials Sector
Mitsui Mining & Smelting Co., Ltd.

MITSUI KINZOKU

Participants in Today's Meeting

We promote the well-being of the world through a spirit of exploration and diverse technologies.

- Masato Okabe, Senior Managing Director and Senior General Manager of the Engineered Materials Sector

- Tatsuya Sudo, Executive Officer and Director of the Copper Foil Division

- Takeshi Miyazono, Executive Officer and Director of the Engineered Powders Division

- Daisaku Kobayashi, President and CEO, Nippon Yttrium Co., Ltd.

- Tomoo Nagatome, Director of the Ceramics Division

We promote the well-being of the world through a spirit of exploration and diverse technologies.

Table of Contents

P1	Participants in Today's Meeting
P5	Our Business Matrix
P6	Copper Foil Division
P7	Bases and Production Capacities of the Copper Foil Division
P8	Major Applications and Market Trends of MicroThin™ for Packages (Smartphones)
P9	Major Applications and Market Trends of MicroThin™ for Packages (Non-smartphones)
P10	Sales Performance and Forecast for MicroThin™ for Packages
P11	Sales Performance and Forecast for MicroThin™ for HDI
P12	Sales Prospects and Production Capacity for MicroThin™
P13	Demand Forecast for Copper Foil for Multilayer PCBs for Communication Infrastructure
P14	Copper Foil for High-Frequency Communication Infrastructure (VSP™/MLS®-G)
P15	Sales Performance and Forecast for High-Grade VSP™
P16	Reinforcement of the Product Development Structure
P17	Thin Embedded Capacitor Material FaradFlex®

Table of Contents

P18	Sales Performance and Forecast for FaradFlex®
P19	News Releases Related to the Copper Foil Business
P25	Engineered Powders Division
P26	Strength of the Engineered Powders Division – Utilization of Powder Control Technologies in New Product Development
P27	[Existing Products] Sales Plans for Copper Powders for Electronic Materials
P28	[New Product] (1) Minor Metal Solutions (iconos™)
P29	[New Product] (1) Business Deployment of Minor Metal Solutions (iconos™)
P30	[New Product] (2) Use of Silver-Coated Copper Powders in Solar Cells
P31	[New Product] (3) NANOBIX™, SiC Wafer Abrasive
P32	[New Products] (4) Copper Powder for Additive Manufacturing (5) Negative Thermal Expansion Powder
P36	Nippon Yttrium Co., Ltd.
P37	Future Growth Potential and Creation of Synergy
P38	Results and Prospects for Protective Coating Materials for Semiconductor Production Equipment
P39	Rare Earth Recycling Business

Table of Contents

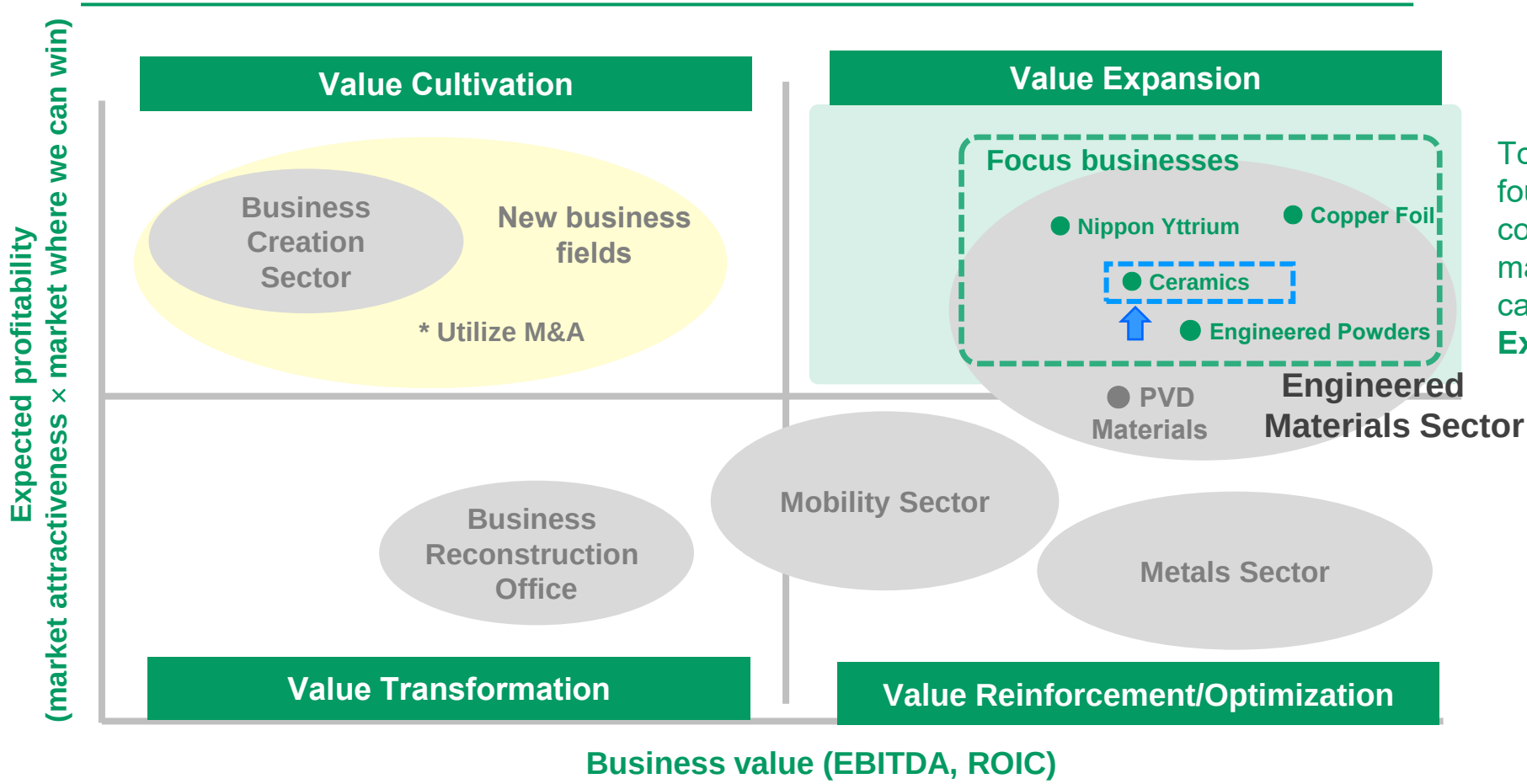
We promote the well-being of the world through a spirit of exploration and diverse technologies.

P40	Ceramics Division
P41	Ceramics Division - Vision for 2030
P42	Growing Market (1): Setter for Firing MLCC
P43	Growing Market (2): Precision Filter for Quality Aluminum
P44	Newly Developed Products

Our Business Matrix

We added the ceramics business to Value Expansion and have been implementing measures to further expand profits in **four business units**.

■ Business evaluation matrix



Today, we will explain these four focus businesses, which constitute our engineered materials business and are categorized into **Value Expansion.**

Copper Foil Division

Bases and Production Capacities of the Copper Foil Division

We promote the well-being of the world through a spirit of exploration and diverse technologies.

One of the strengths of Mitsui Kinzoku in the copper foil business is the ability to supply materials globally in a stable manner and flexibly address users' needs that we have cultivated over years.
Recently, we decided to implement a plan to increase the production capacity for MicroThin™ until 2030 by focusing on improving productivity in ACF and MCF.
In anticipation of further expansion of demand for electro-deposited copper foil VSP™, we have decided to expand the production capacity for the copper foil in Taiwan and start its production in Malaysia.

<Total Production Capacity>
4,200 tons/month
(including MicroThin™: 4,900 km²/month)

Ageo Operation <ACF>
(Ageo-shi, Saitama)
<Production Capacity> 500 tons/month
(including MicroThin™: 2,500 km²/month)

Increase in MT production capacity
From 2,500 to 2,800 km²/month (2030)
(Announced in the news release dated January 7, 2025)

China network
- Mitsui Copper Foil (Hong Kong) Co., Ltd. <Sales base>
- Mitsui Copper Foil (Suzhou) Co., Ltd <Processing base>
- Mitsui Kinzoku Trading (Shanghai) Co., Ltd <Marketing base>
- Mitsui Kinzoku Trading (Shanghai) Co., Ltd. Shenzhen Office <Marketing base>

San Jose Office
(CA, U.S.A.)
<Marketing base>

Oak-Mitsui Technologies LLC
(Frankfort, Kentucky U.S.A.)

Mitsui Mining & Smelting Co., Ltd.
Taiwan Representative Office
<Marketing base>

MITSUI COPPER FOIL (MALAYSIA) SDN. BHD, <MCF>
(Selangor, Malaysia)

<Production Capacity> 2,000 tons/month
(including MicroThin™: 2,400 km²/month)

Taiwan Copper Foil Co., Ltd. <TCF>
(Nantou Hsien, Taiwan, R.O.C.)

<Production Capacity> 1,700 tons/month

Construction of new VSP production facilities
60 tons/month
(Announced in the news release dated January 7, 2025)

Increase in MT production capacity
From 2,400 to 2,800 km²/month (2030)
(Announced in the news release dated January 7, 2025)

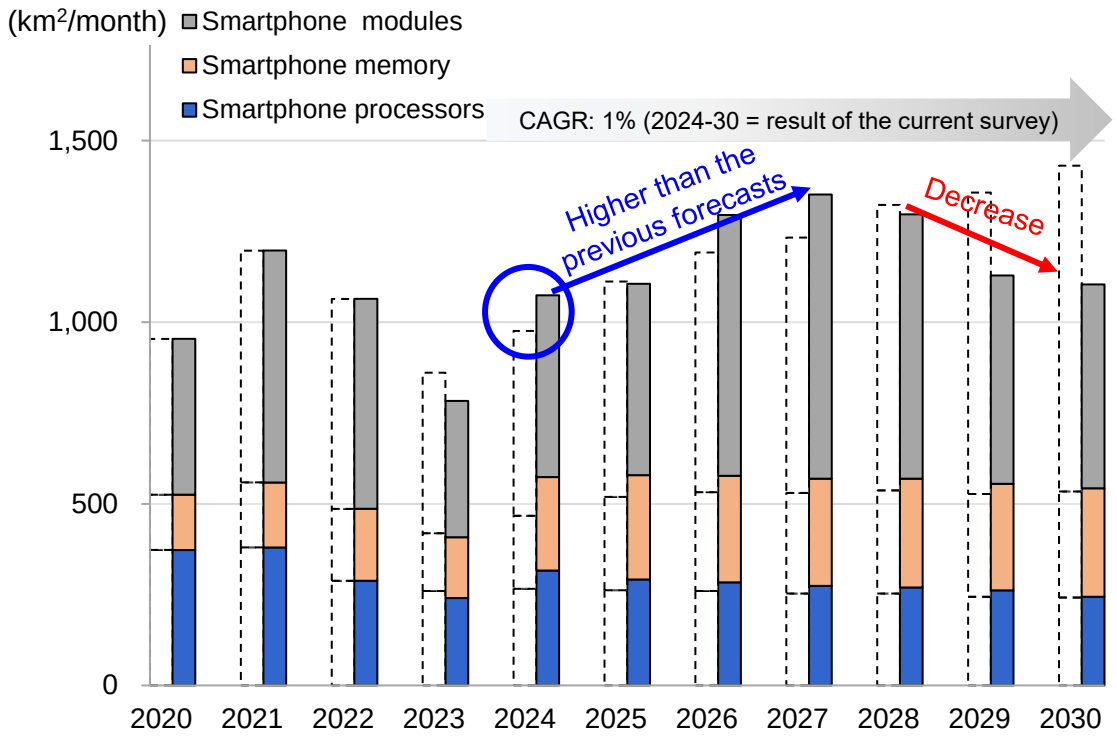
Increase in VSP production capacity
From 420 to 520 tons/month
(Announced in the news release dated January 7, 2025)

- Production/sales base
- Sales/processing base
- Marketing base

Major Applications and Market Trends of MicroThin™ for Packages (Smartphones)

The sales of smartphones have already seen slow growth because the market has matured and for other reasons, and we recently made downward revisions to the forecasts for 2028 and beyond.
Especially, usage in 5G mmWave modules will increase with the spread of multiband models until around 2028, but is expected to decrease after that.

CAGR by smartphone package use
(Left: previous explanation meeting in 2024, right: this explanation meeting)



* Based on the results of a survey by a research agency

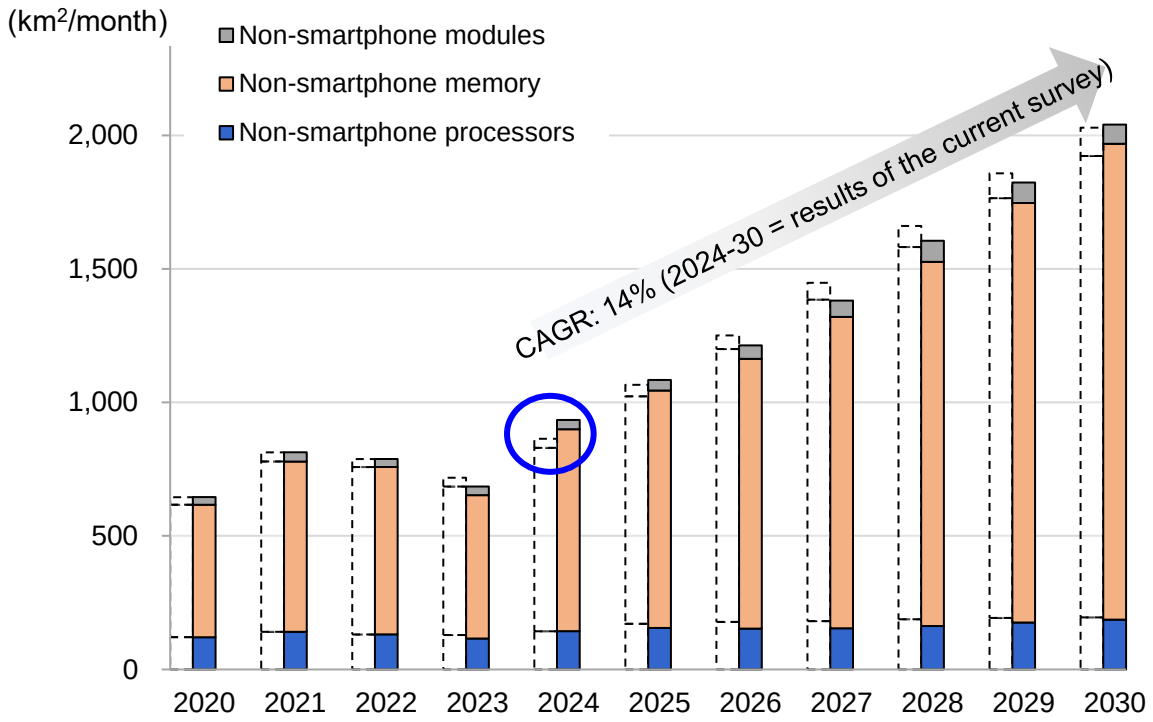
Usage in modules (CAGR: 2%)	• Usage in modules accounts for more than half of the total demand for MicroThin™ for packages for smartphones • The growth of usage in RF modules will be limited due to low unit sales growth though usage per unit will increase. • Usage in 5G mmWave modules will increase with more multiband models until 2027 to 2028, but will decrease after that.
Usage in memory (CAGR: 3%)	• Though only one unit is installed in a single smartphone, usage in memory is expected to grow due to the following possibilities: - Adopting use of MSAP for the center layers of three-layer LPDDR*1 substrates - Increase in the number of layers in eMCP*2 substrates (from two layers to three layers)
Usage in processors (CAGR: -4%)	• No change from the previous forecast • Due to the sluggish growth of unit sales of smartphones, usage of MicroThin™ in processers is expected to show a slight decline in the future.

*1 Low-Power Double Data Rate: Memory designed specifically to consume less power based on standards derived from SDRAM.
*2 Embedded Multi Chip Package: Memory package designed to reduce mounting area and power consumption

Major Applications and Market Trends of MicroThin™ for Packages (Non-smartphones)

Demand for MicroThin™ in non-smartphones, especially in data centers and other communication infrastructure, is expected to continue to increase in the long-term.
Future growth will be driven mostly by usage in memory, but usage in on-vehicle modules and processors for wearable devices are also expected to increase.

CAGR by non-smartphone package use
(Left: previous explanation meeting in 2024, right: this explanation meeting)



* Based on the results of a survey by a research agency

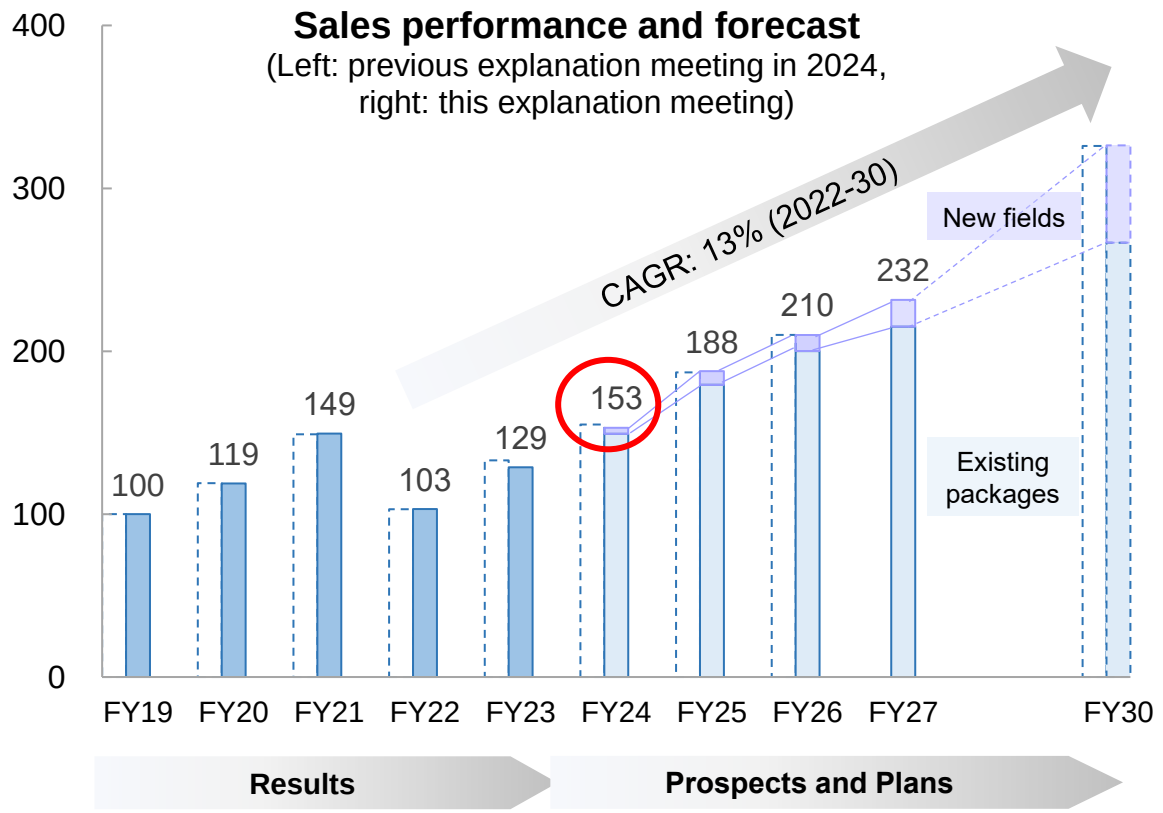
Usage in modules (CAGR: 13%)	• Introduction of MicroThin™ in image sensors and millimeter-wave radars for ADAS and automatic driving is expected. • Owing to the growth of IoT, usage of MicroThin™ in WiFi and other communication modules for industrial equipment is expected to increase.
Usage in memory (CAGR: 15%)	• There will be a shift toward DDR5 with a high use rate of MSAP, and use in LPDDR is expected to increase. • In data centers, where the largest demand is expected, demand for MicroThin™ in general-purpose servers as well as in high-speed processing for generative AI can be expected to expand. • Though usage in on-vehicle applications account for about 10%, usage in ADAS and automatic driving will also increase.
Usage in processors (CAGR: 4%)	• Usage of MicroThin™ in processers is mainly in FC-BGA. • It is expected that usage in smartwatches, VR headsets, etc., will increase though the scale is not so large.

Sales Performance and Forecast for MicroThin™ for Packages

We promote the well-being of the world through a spirit of exploration and diverse technologies.

In FY2024, demand recovered to bring us back to a state where we can receive orders on actual demand and has continued to be strong mainly in data centers and other applications. Future growth will be driven mainly by usage in non-smartphones, and we aim to promote usage in a wider range of applications and increase use in new fields.

Sales volume * Index based on the sales volume in FY 2019 set at 100



FY23
- Prolonged inventory adjustment has been gradually coming to an end, and demand has been recovering to a state where we can receive orders based on actual demand.

FY24
- Demand for MicroThin™ especially in memory and modules for non-smartphones expanded and recovered to the level in 2021.

Forecast for FY25 and beyond
- Increase in the number of electronic devices where MicroThin™ is used with the popularization of 5G technologies.
- Expansion in the use of MicroThin™ in servers and installation of other applications

[Applications where the use of MicroThin™ is expected to increase]
- Optical modules
- High-multilayer PCBs for ultra-high-speed infrastructure
- Flexible printed wiring boards for ultra-high-speed communications

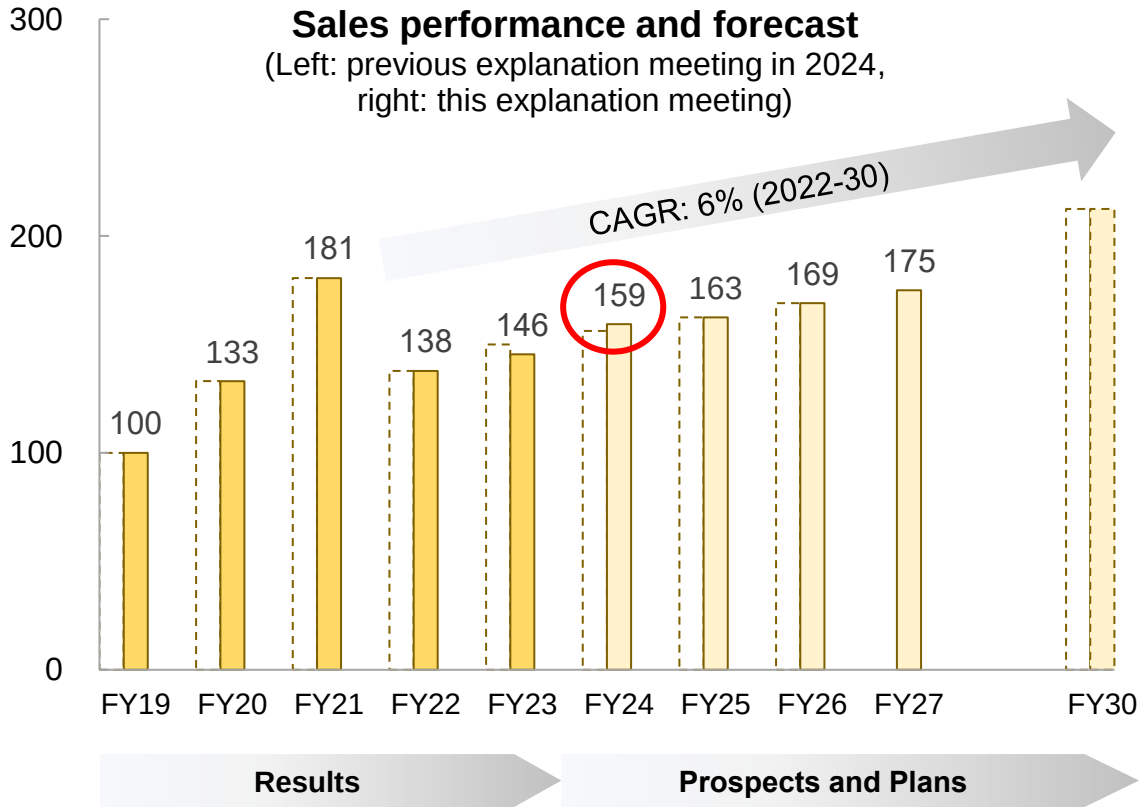
Currently, we are working hard on marketing activities and product development in order to create new businesses.

MITSUI KINZOKU

Sales Performance and Forecast for MicroThin™ for HDI*1

In FY2024, unit sales of North American brand smartphones remained flat, but demand for MicroThin™ increased slightly. In addition, currently, the use of MSAP in Chinese smartphones, especially in foldable models, has been rapidly increasing.

Sales volume * Index based on the sales volume in FY19 set at 100



FY23
- Unit sales of North American brand smartphones remained flat, but demand for MicroThin™ increased slightly.
- Among Chinese smartphones, there's a growing trend of models using MicroThin™, particularly in foldable models.

FY24
- Unit sales of North American brand smartphones remained flat, but demand for MicroThin™ increased slightly.
- MicroThin™ has been introduced in smartphones (foldable models) of an increased total of four Chinese smartphone manufacturers.

Forecast for FY25 and beyond
- Expansion of introduction of MicroThin™ in Chinese high-end models
- Increase in the number of electronic devices where MicroThin™ is used with the popularization of 5G technologies

- Enhance promotion to encourage Chinese smartphone manufacturers (OEMs) to use MSAP.
- Explore the use of MicroThin™ in HDI for non-smartphones (related to AR, VR, etc.)

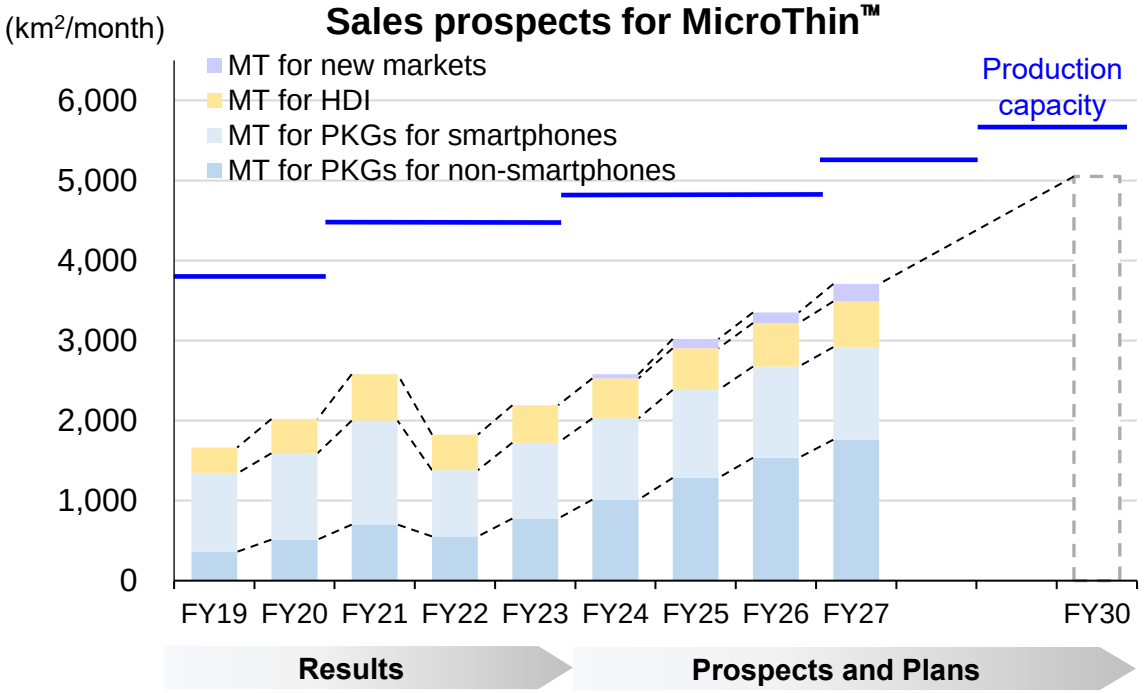
Foldable smartphones have come to use increasingly thin substrates and require narrower circuits to suppress noise. As a result, opportunities to use MSAP have been rapidly increasing.

*1: High Density Interconnected PCB

Sales Prospects and Production Capacity for MicroThin™

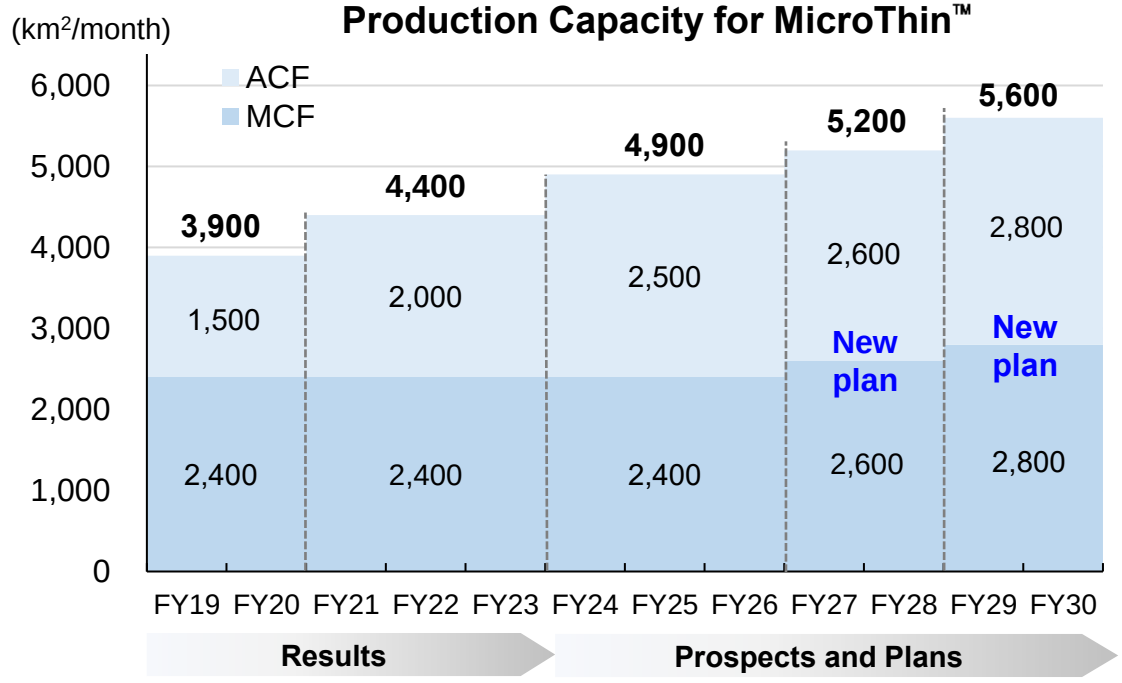
The sales of MicroThin™ will continue to increase with the advancement of high-speed communication technology. Our production system has adequate production capacity to accommodate present demand increases, but we have developed long-term production capacity expansion plans based on continuous improvements in productivity toward 2030.

Sales prospects for MicroThin™



- MicroThin™ for packages
  Demand in non-smartphone fields is expected to expand due to increases in communication capacity and speed, etc.
- MicroThin™ for HDI
  Promotion of use of MSAP to Chinese smartphone manufacturers (It is now used by four Chinese smartphone manufacturers.)
- MicroThin™ for new markets
  We are working to promote the use of MicroThin™ in HSD for high-speed infrastructure, etc.

Production Capacity for MicroThin™



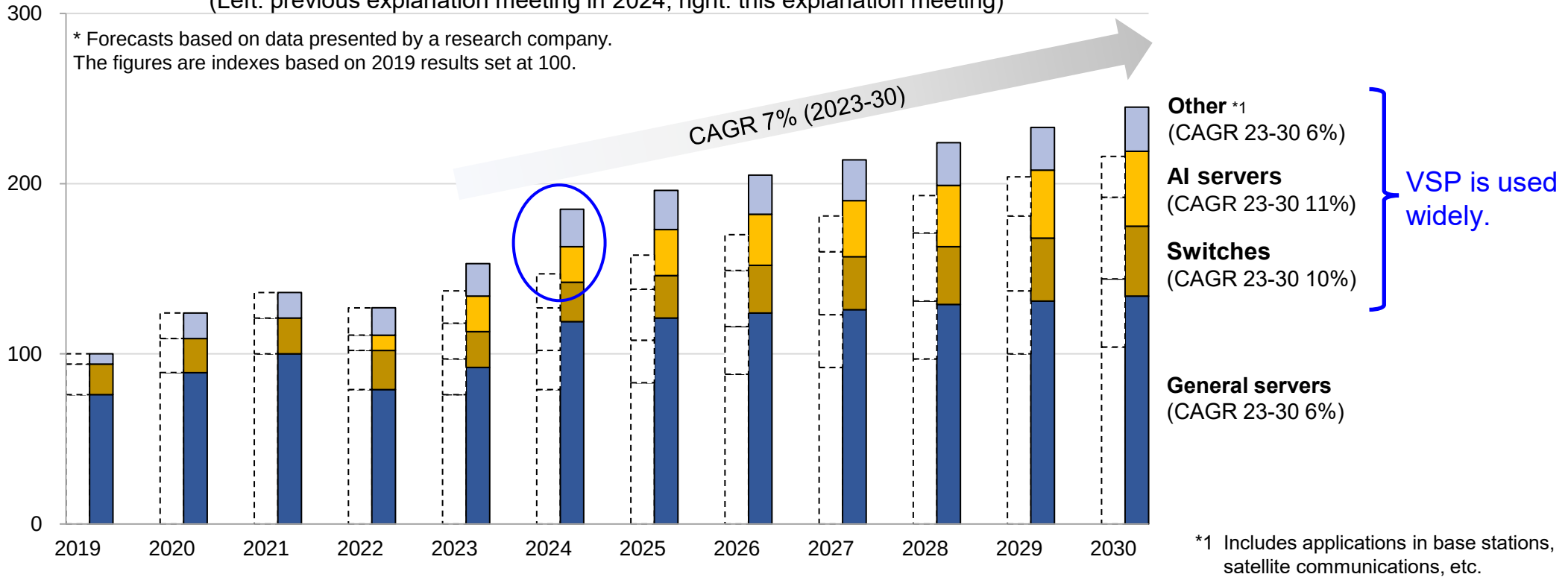
- For the time being, we will strive to expand the production capacity by improving labor productivity through job satisfaction reforms and improving operation rates, yields and other technology coefficients through DX.
- From FY2027 onward, we will remodel the existing facilities and take other measures to expand the production capacity.

Demand Forecast for Copper Foil for Multilayer PCBs for Communication Infrastructure

VSP™ is used as a material for multilayer PCBs for communication infrastructure, such as servers, routers and 5G base stations. Currently, demand for the material (mainly in AI servers and switches) has been rapidly expanding at a much faster pace than the previous forecast.

Demand for copper foil for multilayer PCBs for infrastructure

(Left: previous explanation meeting in 2024, right: this explanation meeting)

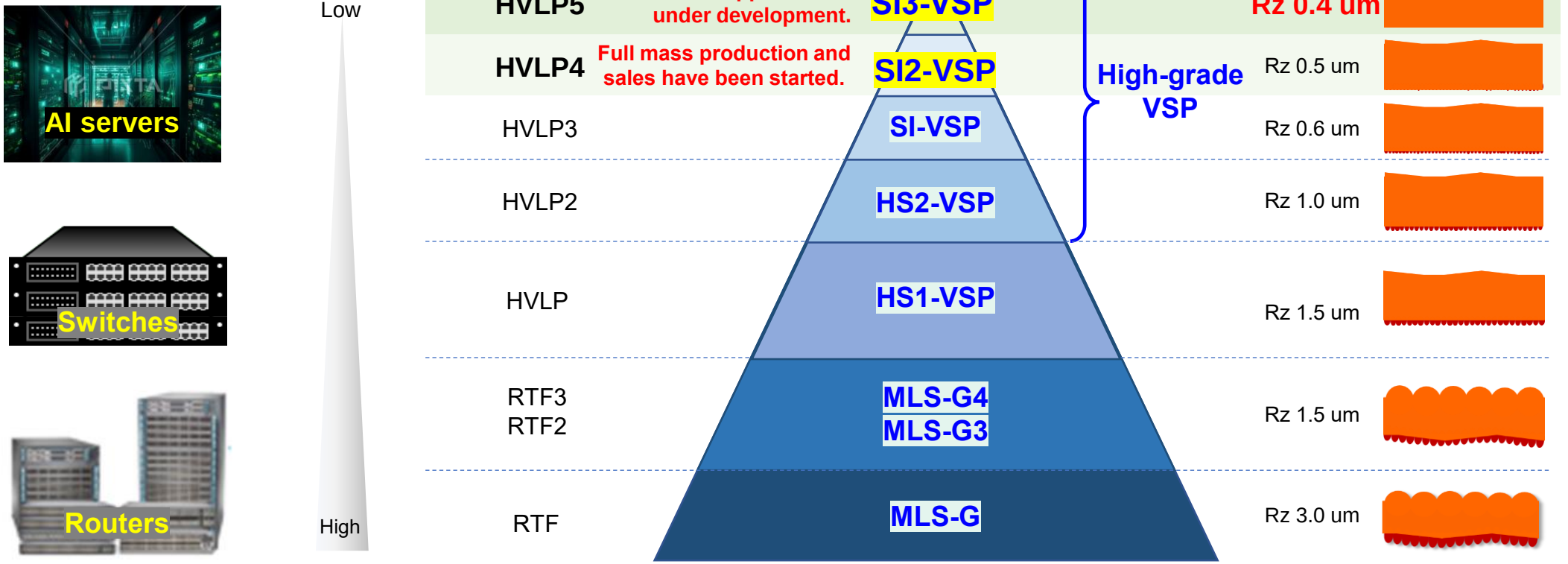


*1 Includes applications in base stations, satellite communications, etc.

Copper Foil for High-Frequency Communication Infrastructure (VSP™/MLS®-G)

We promote the well-being of the world through a spirit of exploration and diverse technologies.

Owing to growing demand for generative AI, etc., there have been increases in data traffic and expanding demand for higher speed communication, and it is our high-grade copper foil that backs up these trends. Recently, we have started the full mass production and sales of copper foil of category HVLP4 (SI2-VSP) and started developing new copper foil of category HVLP5 (SI3-VSP).

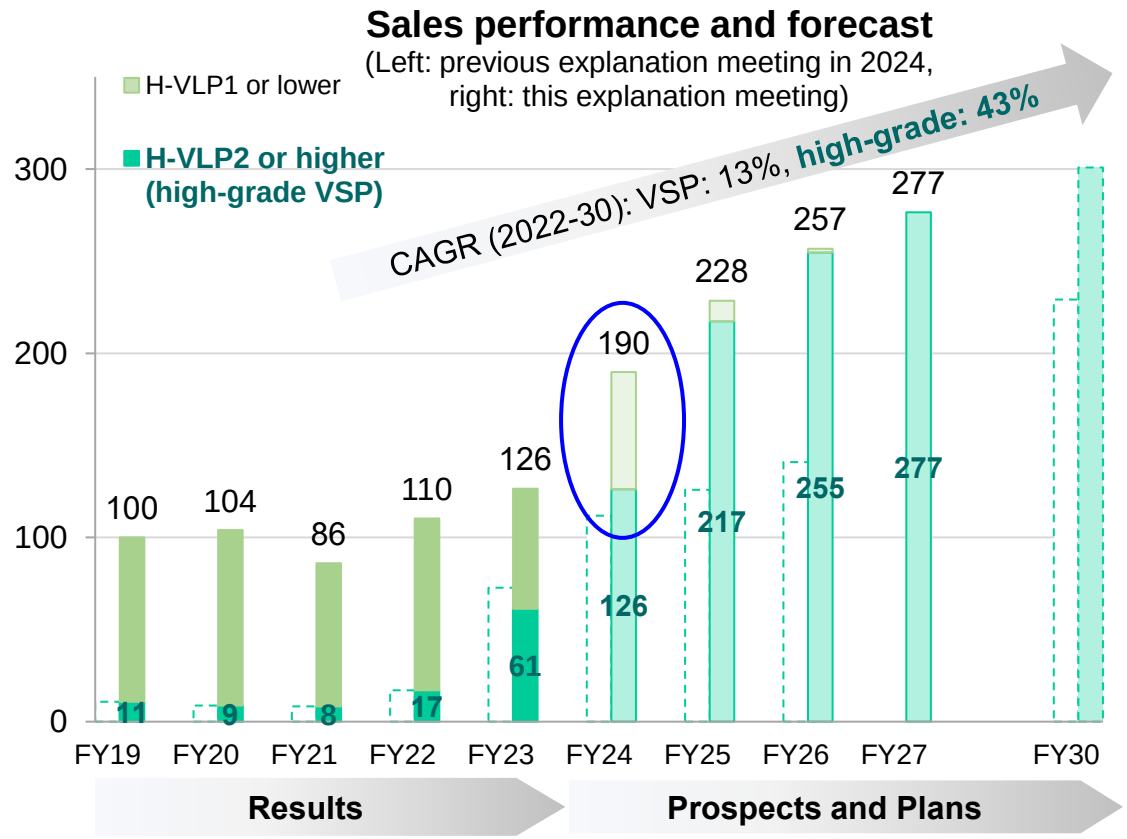


Sales Performance and Forecast for High-Grade VSP™

We promote the well-being of the world through a spirit of exploration and diverse technologies.

In FY2024, demand for the product in AI servers and other applications in the communication infrastructure market saw great growth, and we could capture demand for high-grade VSP foil (category HVLP2 or higher) for higher speed transmission. From FY2025 onward, further expansion of demand is expected.

Sales volume * Index based on the sales volume in FY19 set at 100



Up to FY23

- High-grade products would come to be used in AI servers, high-speed routers, etc., and put into mass production.

FY24

- Demand for high-grade products of HVLP2 and higher categories mainly in AI servers and high-grade switches rapidly expanded.
- The production capacity for VSP foil in Taiwan was increased (from 420 to 520 tons/month).

Our products' share of the high-grade VSP market is estimated to be 60%.

Forecast for FY25 and beyond

- Plan to expand sales of mainly high-grade products of HVLP3 and higher categories
- Start production of VSP in Malaysia (60 tons/month)

To steadily address the demand that is growing day by day, we will continue to consider further increasing production in a timely manner.

Reinforcement of the Product Development Structure

To achieve further growth and development in the copper foil business, we have completed the installation of a processing machine for development tests and started using it.
We aim to speedily commercialize products in line with the major development themes.

Speeding up of product development

New installation of a processing machine for development tests (news release on January 10, 2023)	
Installation location	Ageo Operation (ACF)
Characteristics	• The machine is designed to allow flexibility in testing and enables us to conduct a variety of tests. • Copper foil of sizes that can be evaluated in customers' mass production facilities can be provided.
Major products to be developed	• Copper foil for semiconductor package substrates • Copper foil for high-frequency, high-speed PCBs • Copper foil for module substrates • Copper foil for fields other than circuit materials

We completed trial runs of the machine in the first half of 2024 and are currently using it mainly for manufacturing sample foil for the internal evaluation of developed products.

Major development themes

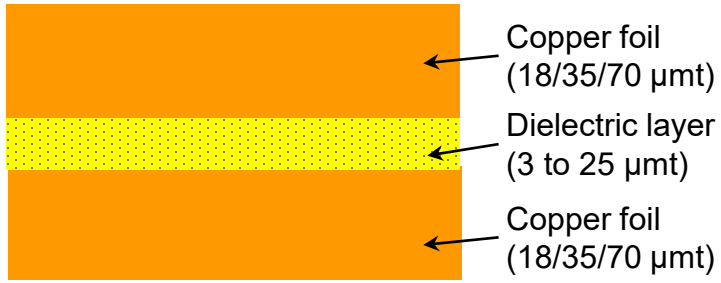
Field	Solution	Anticipated applications
HSD	Surface-treated MT for high-speed communications	High-speed communication equipment such as servers and switches
PKG/HDI HSD/FPC	MicroThin™ with stable release strength at ultra high temperature	FPC-MSAP, camera modules, etc.
PKG (FC-BGA)	Surface treatment appropriate for SAP	FC-BGA substrates and other products using SAP
Others	Diversification	We are developing products for applications other than circuits.

Website for Seeking Potential Partners to Create New Applications

Thin Embedded Capacitor Material FaradFlex®

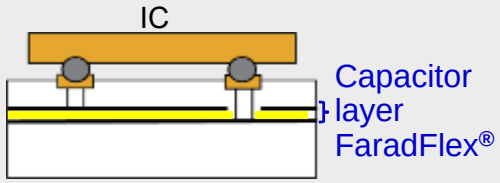
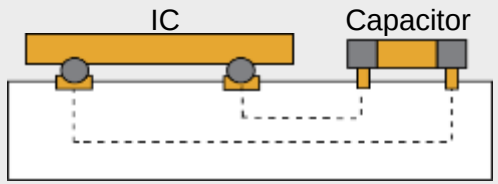
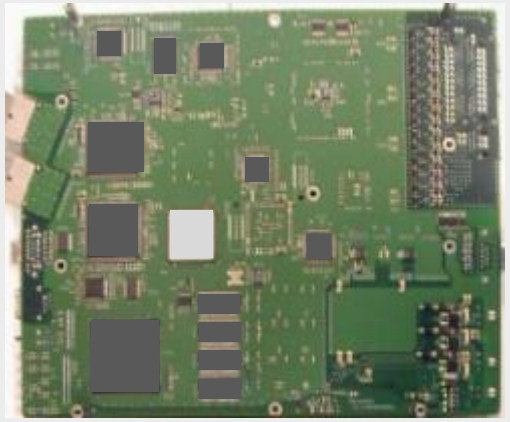
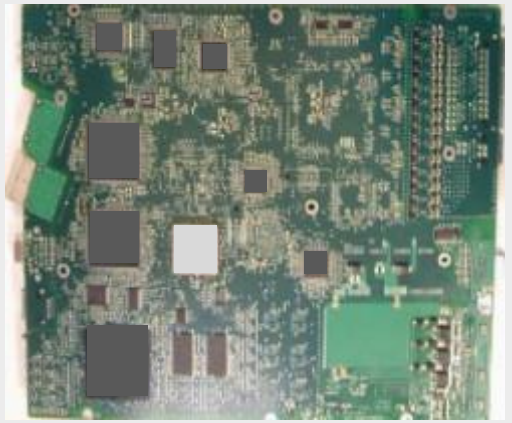
We promote the well-being of the world through a spirit of exploration and diverse technologies.

FaradFlex®, which is made of a dielectric layer sandwiched between copper foil layers, is embedded in PCBs as a material that replaces capacitor parts conventionally mounted on PCBs. This increases flexibility in designing PCBs and contributes to reducing communication noise, making PCBs thinner and reducing their areas.



As a thin embedded capacitor material, FaradFlex® is provided for applications where low impedance, high capacitance and high reliability are required, such as the following:

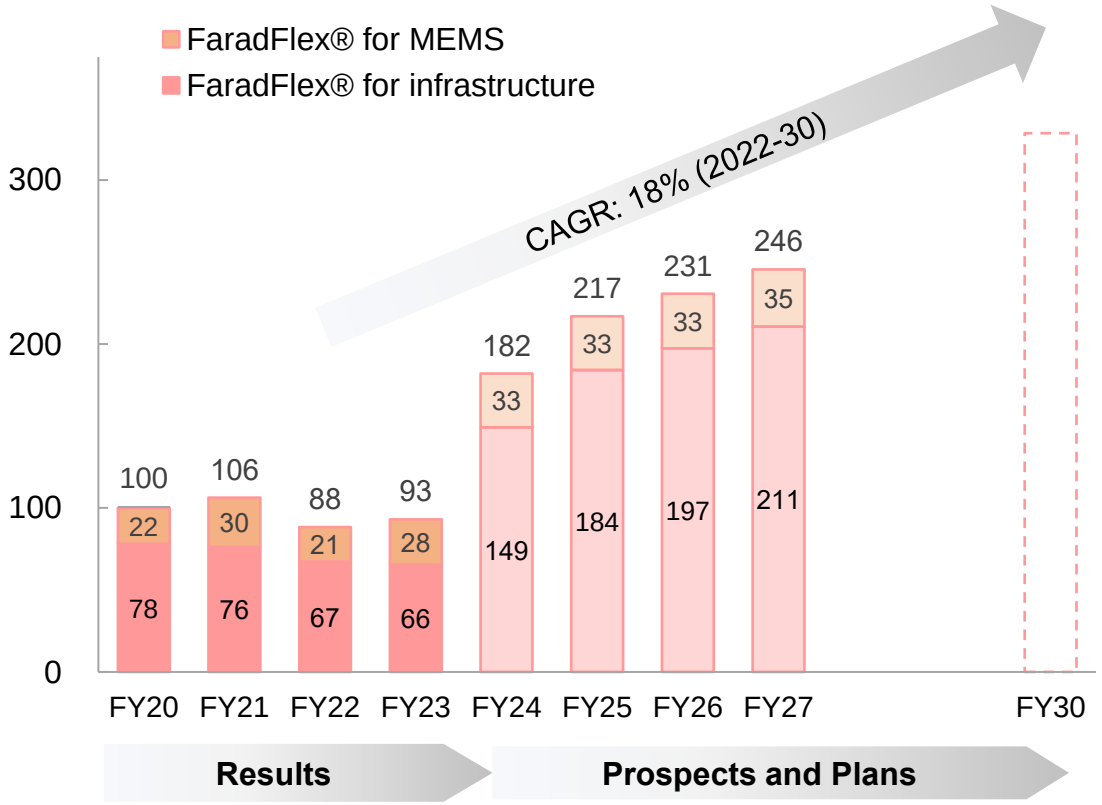
- PCBs for MEMS
- Routers and switches for advanced servers
- Multilayer PCBs for high-speed, large-capacity communications
- Semiconductor testers

	PCB using FaradFlex®	PCB using no FaradFlex®
Structure diagram		
Exterior photo of PCB		

Sales Performance and Forecast for FaradFlex®

In communication infrastructure, especially in AI servers and switches, PCBs have seen the rapid growth of trends such as thinner substrates with increases in the number of layers and reductions in areas. Owing to these trends, the demand for thin embedded capacitor material FaradFlex® has recently been expanding rapidly.

Sakes volume * Index based on the sales volume in FY2020 set at 100



Up to FY2023

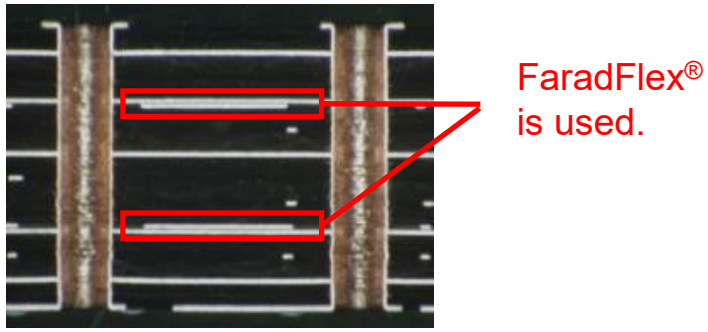
- Demand for FaradFlex® in MEMS microphones had seen sluggish growth.
- Inventory adjustment due to lower investment in infrastructure and other reasons had been continued.

FY2024

- Demand for FaradFlex® in AI servers, high-grade switches and other types of infrastructure rapidly expanded.
- MCF as well as ACF started production, and a two-location production system was established.

FY2025 and beyond

- Continue to expand sales mainly for infrastructure.
- Further increase production capacity in MCF.



Cross-section photo of a multilayer PCB for infrastructure

News Releases Related to the Copper Foil Business

We will make efforts to expand our business in the future as follow:

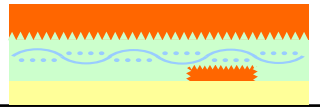
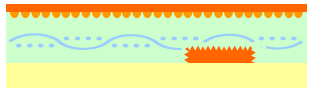
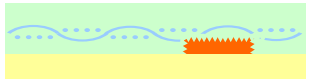
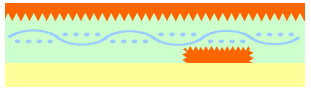
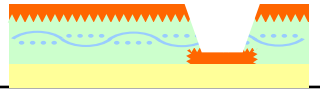
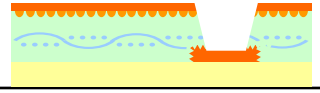
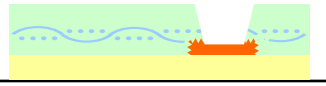
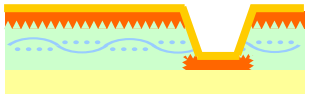
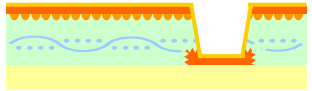
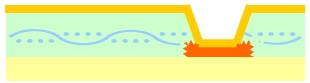
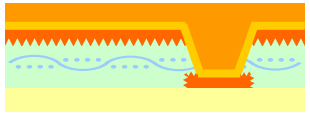
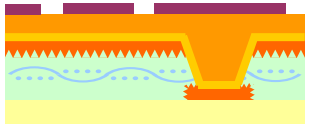
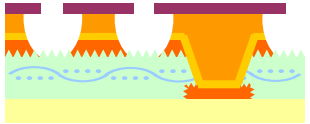
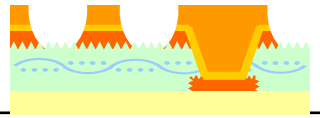
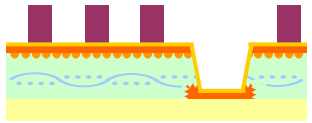
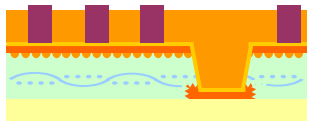
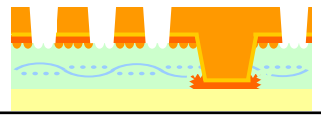
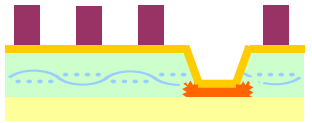
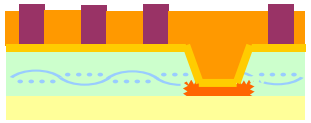
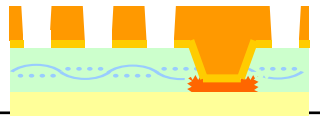
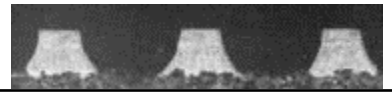
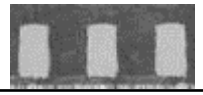
Date of release and title	Aim	Intent
January 7, 2025 “Mitsui Kinzoku Plans to Increase MicroThin™ Production Capacity”	**Enhance the ability to supply the product in a stable manner in order to increase its use by existing users and in new fields.**	Increase the total production capacity of the Ageo Operation and the Malaysia Plant from the current 4.9 million m^2 to 5.6 million m^2 in 2030.
January 7, 2025 “Production Capacity Enhanced for VSP™ Electro-Deposited Copper Foil for High-Frequency Circuit Boards”	**Expand supply of the product in response to demand in AI-related applications (such as servers, routers and switches).**	Increase the production capacity for the product by approx. 40% from the current level to 580 tons/month by increasing the production capacity at the Taiwan Plant and commencing production at the Malaysia Plant.

Appendix

Same as the previous version

We promote the well-being of the world through a spirit of exploration and diverse technologies.

Appendix 1: Comparison of Subtractive Process/MSAP/SAP

Process	Subtractive process	MSAP (Modified Semi-Additive Process)	SAP (Semi-Additive Process)
Laminate pressing			
Half etching		—	—
Laser perforation			 Including desmear removal
Electroless copper plating			
Patterning	Panel plating  Dry film exposure/ development  Hard etching  Dry film removal 	Dry film exposure/ development  Panel plating  Dry film removal  Seed layer thickness: 1.0 to 3.0 μm Flash etching 	Dry film exposure/ development  Pattern plating  Dry film removal  Seed layer thickness: 0.5 to 1.0 μm Flash etching 
Photo of circuit			

Same as the previous version

We promote the well-being of the world through a spirit of exploration and diverse technologies.

Appendix 2: Examples of Application of Our MicroThin™ for Packages

Our MicroThin™ is used for a wide range of applications, mainly in an L/S range of 10/10 to 30/30 μm.

Equipment	Substrate	Target L/S [μm]			Remarks
		>30/30 μm	30/30 to 10/10 μm	10/10 μm>	
Smartphone	SoC	—	○	○	Fine pitch spec models are available.
	DRAM (LPDDR)	—	○	—	–
	Mobile NAND	—	○	—	–
	RF module	—	○	—	–
	mmW antenna and AiP	—	○	—	Used for 5G mmWave transmitting and receiving antennas. MSAP is used to meet demand for low roughness and high circuit accuracy.
Server/PC	CPU	—	—	—	FC-BGA substrate
	GPU	—	—	—	FC-BGA substrate/HBM
	DRAM (DDR)-DIMM	—	○	—	–
	NAND-SSD	—	○	—	–
	Controller-SSD	—	○	○	Same as SoC in smartphones.

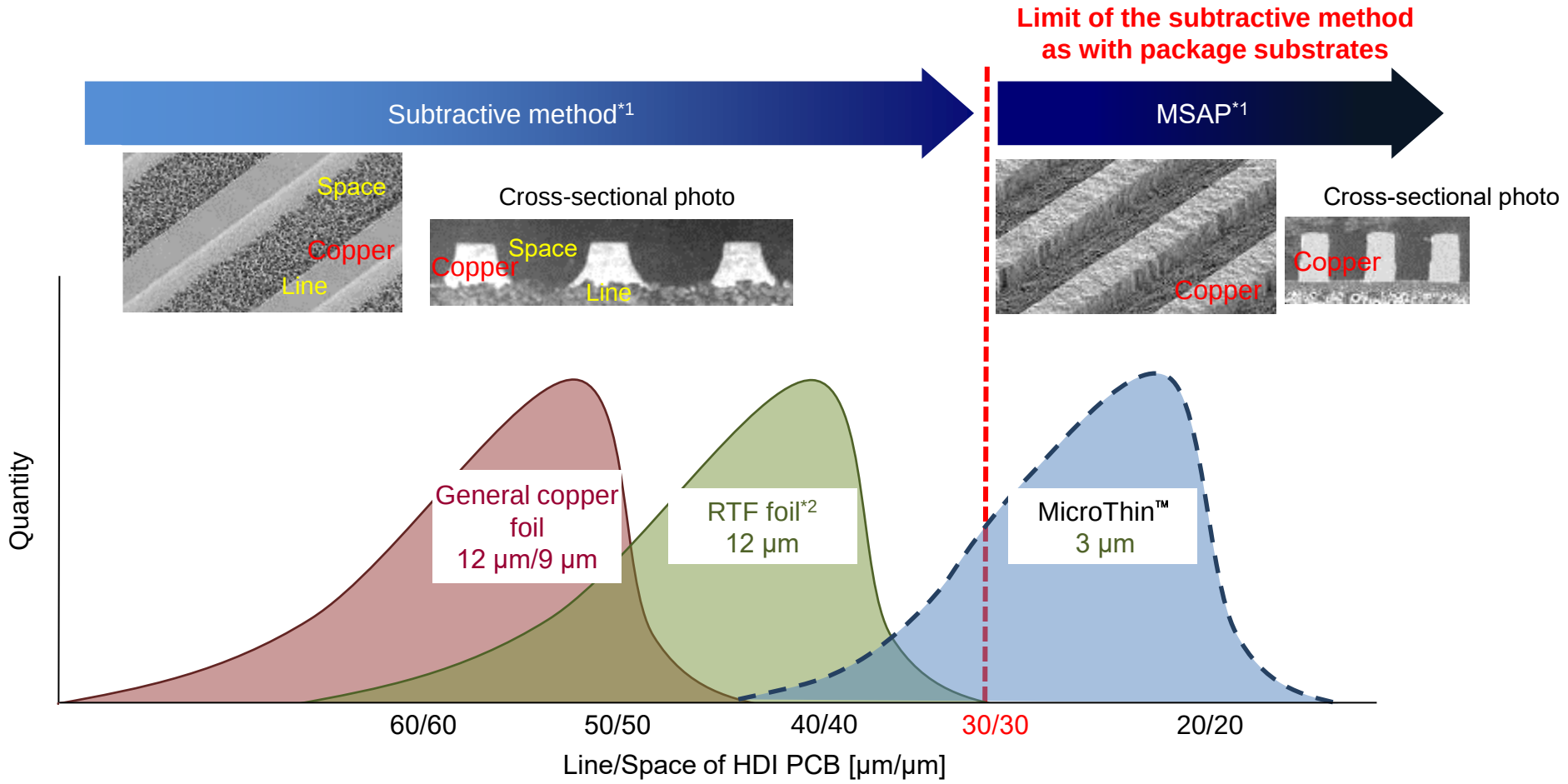
* To meet demand for further finer pitches, HRDP® is available. For details about HRDP®, refer to the announcement in the following link:
News release dated May 15, 2023: Expansion of Facility Manufacturing HRDP®, a Specialty Carrier for Next-Generation Semiconductor Packaging

Same as the previous version

We promote the well-being of the world through a spirit of exploration and diverse technologies.

Appendix 3: Increasing Density of Components in HDI PCBs and History of Production Processes: The Driver of the Development of Micro-thin Copper Foil

MSAP using micro-thin copper foil is suitable for use with HDI PCBs with a circuit width of 30/30 μm (line/space) or less.
The MSAP method is now used as the production process for Chinese high-end smartphones, and is expected to be used more widely in the future.



*1: Refer to Appendix 1.
*2: Reverse Treated Foil is copper foil with the shiny surface roughened. It can reduce trailing when forming patterns.

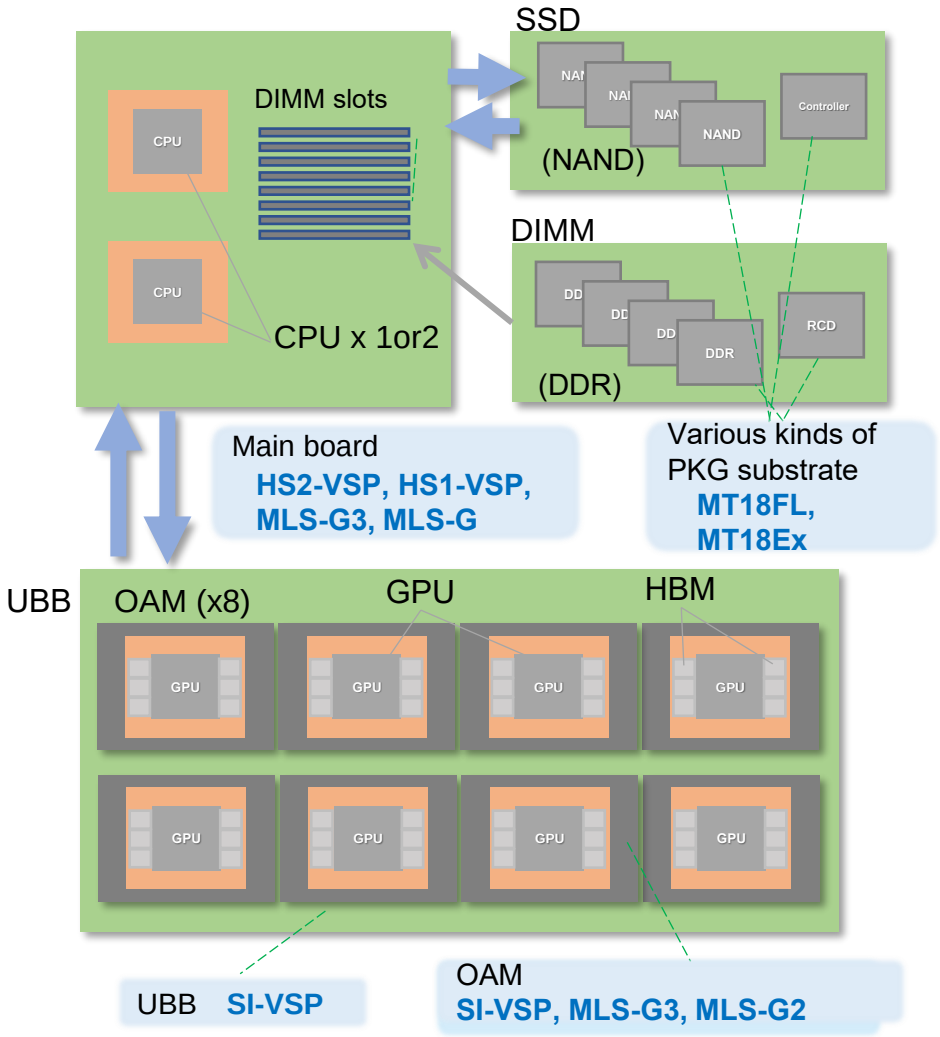
MITSUI KINZOKU

Updated by adding a latest form

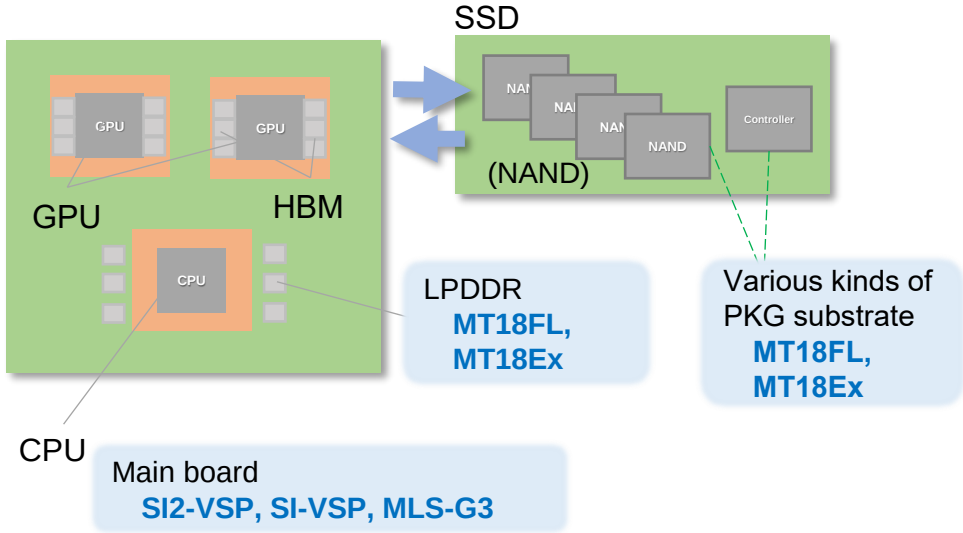
We promote the well-being of the world through a spirit of exploration and diverse technologies.

Appendix 4: Image of an AI Server and Examples of Where Our Copper Foil is Used

High-end server main board (conventional form)



High-end server main board (latest form)



PCB FC-BGA substrate

UBB: Universal Base Board
OAM: OCP Accelerator Module
(OCP: Open Compute Project)
DIMM: Dual Inline Memory Module
SSD: Solid State Drive
DDR: Double Data Rate
LPDDR: Low-Power DDR
GDDR: Graphic DDR

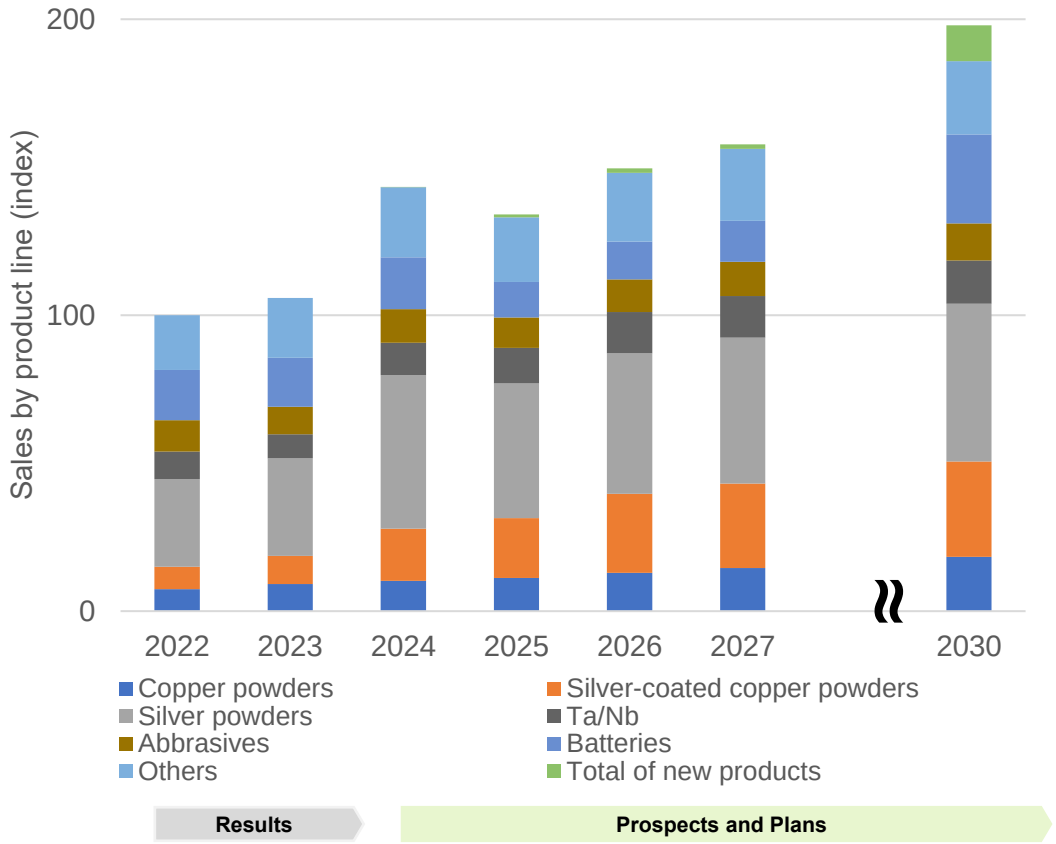
Engineered Powders Division

Strength of the Engineered Powders Division – Utilization of Powder Control Technologies in New Product Development

We promote the well-being of the world through a spirit of exploration and diverse technologies.

The Engineered Powders Division provides a diverse lineup of products, including copper powders, and is utilizing our own powder control technologies to develop new products. We aim to improve our own technologies and work together with partner companies to create and introduce new products and businesses that contribute to the future.

Changes in sales by product line



* The figures take into account the effects of metal market prices.

New products for the 2030 growth target

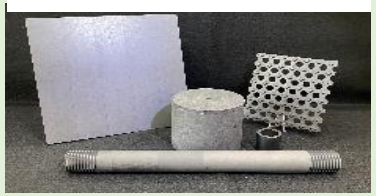
Combine powder control technologies with marketing to develop new products

(1) Minor metal solutions iconos™

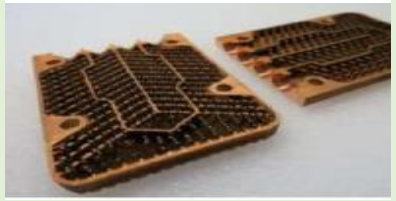
(2) NEW Silver-coated copper powder for solar cells

(3) Abrasive for SiC wafers NANOBIX™

NEW Coating business expanding from iconos™

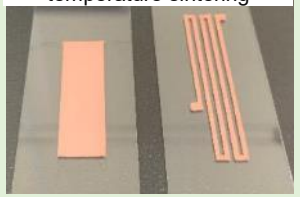


(4) Copper-based powder for additive manufacturing



(5) Negative thermal expansion powder

Copper powder for low-temperature sintering



NIR transmitting black powder

High potential cathode material LNMO

MH alloy for hydrogen storage

[Existing Products] Sales Plans for Copper Powders for Electronic Materials

We promote the well-being of the world through a spirit of exploration and diverse technologies.

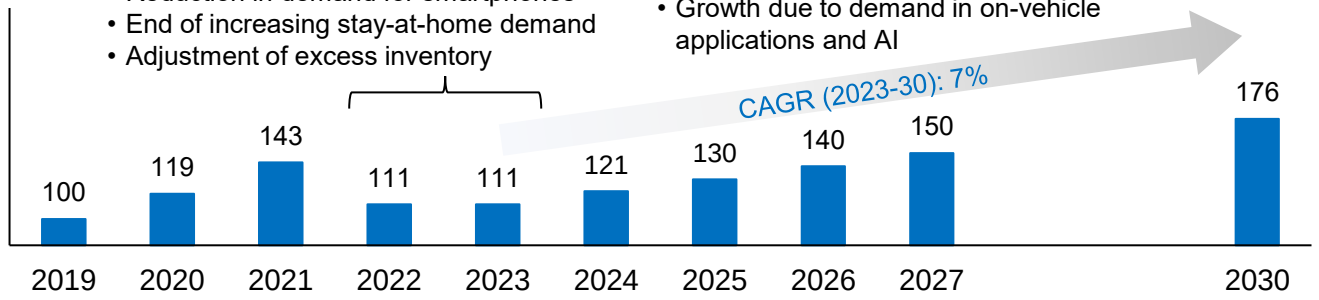
Although we made revisions to the sales plans for copper powders for electronic materials, we expect sales to grow as the MLCC market grows and we acquire new overseas customers.

MLCC market trends and sales plans for copper powders for electronic materials

■ MLCC market forecast: unit sales (index)*1

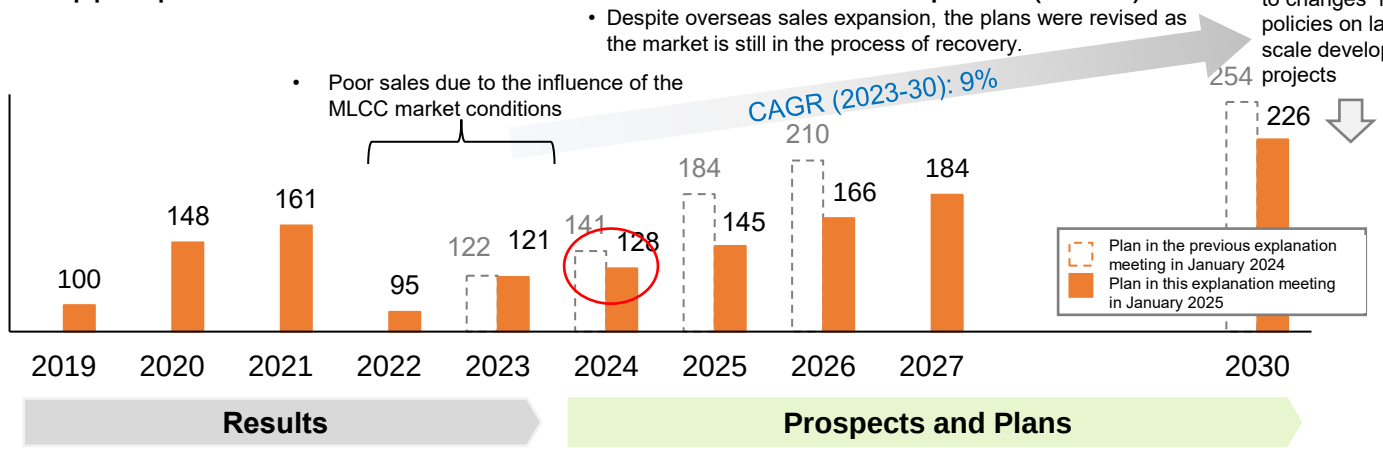
* Internal estimates

- Reduction in demand for smartphones
- End of increasing stay-at-home demand
- Adjustment of excess inventory
- Growth due to demand in on-vehicle applications and AI



■ Copper powders for electronic materials: sales volume plans (index)

- Despite overseas sales expansion, the plans were revised as the market is still in the process of recovery.
- Poor sales due to the influence of the MLCC market conditions
- Delay in growth due to changes in policies on large-scale development projects



Results | Prospects and Plans

Market's and our company's conditions

Prospect for FY23

[Market] The MLCC market would go into a recovery period after having bottomed out.

[Our company] Prepare for regrowth of the MLCC market

- Acquire new overseas customers and have them introduce our products.
- Enhance our production technological capability to improve our competitiveness.

Prospect for FY24

[Market] The MLCC market is still recovering.

[Our company] Strengthen readiness to respond to the regrowing MLCC market.

- Enhance the ability to cater to new overseas customers and expand sales to them.
- Further enhance competitiveness by enhancing our production technological capability.
- Change policies on large-sale development projects (from consumer to on-vehicle applications).

Toward FY30

[Market] The MLCC market is in a regrowth stage.

[Our company] Keep pace with the growth of the MLCC market and expand our market share

- Develop new copper powders for MLCC
- Expand sales to existing overseas customers
- Expand our market share by taking advantage of our technological capability
- Expansion of demand in on-vehicle applications

Expand into applications other than MLCC market applications (next page)

MITSUI KINZOKU

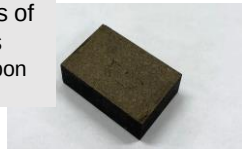
[New Product] (1) Minor Metal Solutions (iconos™)

iconos™

Thin-film coating provides longer lifespans and high functionality.

Appearance of the iconos™ solutions

Extend the lifespans of carbon materials (various kinds of carbon material)



Corrosion-resistant coating field (various plants)

Nature of product

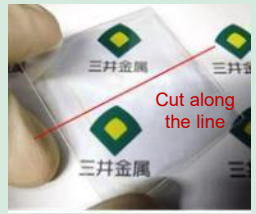
- Water-based solvent solutions to dissolve minor metals that are typically difficult to dissolve in water.
  (Types of metal elements: Nb, Ta, Mo, Ti, etc.)

iconos™ (Examples)

Characteristics

Compared to existing minor metal solutions:

- Our rare metal solutions have enhanced safety and better handling because they do not include strongly acidic chemicals such as hydrofluoric acid, etc.
- They offer excellent reactivity, forming a uniform thin film coating on various materials.



Niobium coated glass

Coating thickness (Cross-sectional photo)

■ **Expected sales and market scale in 2030**

Expected sales potential: two billion to three billion yen
(TaC coating market: 15 billion yen x estimated share: 15% to 20%)

■ **Progress and future prospects**

Accept orders for the coating business, in addition to selling the solutions.
(We are utilizing iconos™ in new promising businesses.)
Refer to the next section.

* The market scale is an internal estimate.

■ **Previous press releases**

March 28, 2024:	**New iconos™ Line of Minor Metal Solution Materials Developed** —The new materials will have a major impact on the inorganic material market—
November 19, 2024:	**Development of Lithium-Ion Battery Materials Using Minor Metal Solutions iconos™** —By coating iconos™ on manganese-based cathode particles (LNMO/LMO), we have overcome technical challenges in the high voltage range—
December 6, 2024:	**Strengthening of the Coating Business in the Engineered Powders Division** —Taking over coating-related patents of Sustainable Titania Technology Inc.—
January 7, 2025:	**Establishment of the Engineered Liquids Commercialization Promotion Division** —Aiming to use engineered liquids in new applications and new businesses, and to achieve high functionality through cross-divisional collaboration—

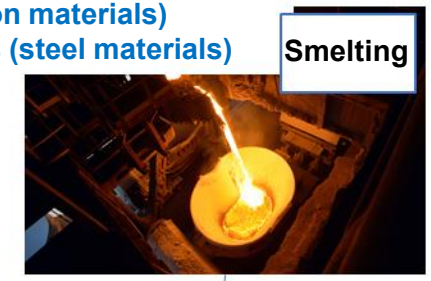
[New Product] (1) Business Deployment of Minor Metal Solutions (iconos™)

Aiming to achieve the expected sales of two to three billion yen in 2030, we are working to open up markets where the iconos™ coatings can play an active part, such as semiconductors, furnace components of all kinds, and power generation.

iconos™ coating business
Strong points: corrosion resistance and heat resistance, high hardness, chemical resistance, low resistance

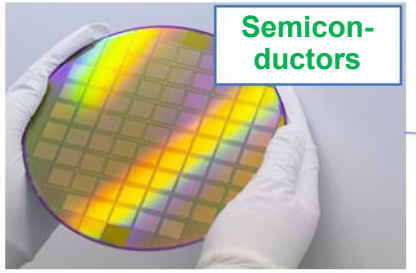
Power generation
Boiler tubes (steel materials)
Fire-resistant materials (ceramic materials)
Conveyors (steel materials)

Smelting
Graphite electrodes (carbon materials)
Plants (steel materials)



Automobiles
Heat treatment of auto parts
Fixing jigs (carbon materials and steel materials)

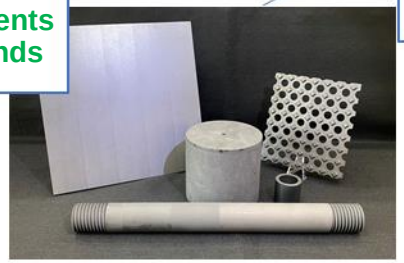
Semicon-ductors
Susceptors (carbon materials)



Batteries and electronic materials
Active material coatings

Ni ultrafine powder coatings

Furnace components of all kinds
Carbon heaters (carbon materials and ceramic materials)
Heat insulation materials (carbon materials)
Thermocouples (carbon materials and steel materials)



Aerospace

Fibers (carbon materials and ceramic materials)

Electrolytic electrodes
Insoluble electrodes (steel materials)

* Green characters: current focus business fields

We promote the well-being of the world through a spirit of exploration and diverse technologies.

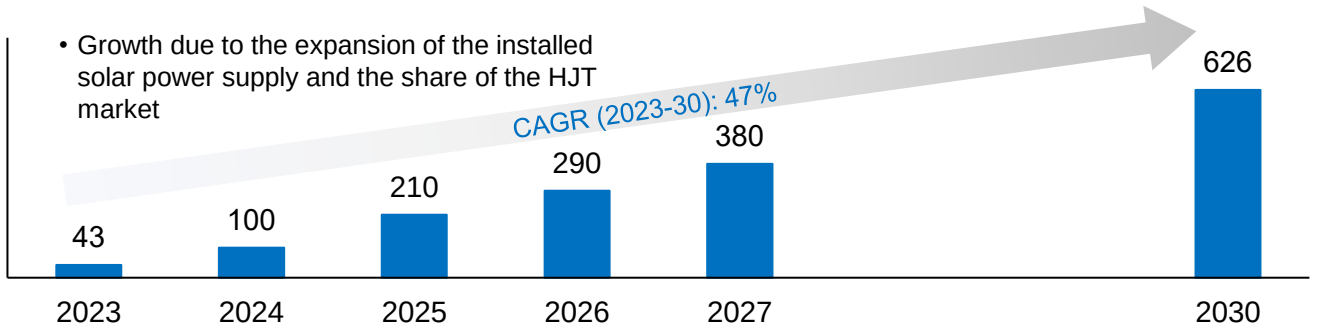
[New Product] (2) Use of Silver-Coated Copper Powders in Solar Cells

In response to trends toward decarbonization and increases in the price of silver, silver-coated copper powders have been used as a replacement for silver powders for heterojunction (HJT) silicon solar cells. We contribute to realizing a decarbonized society by providing metal powders that show electric resistance equivalent to silver at lower prices than silver.

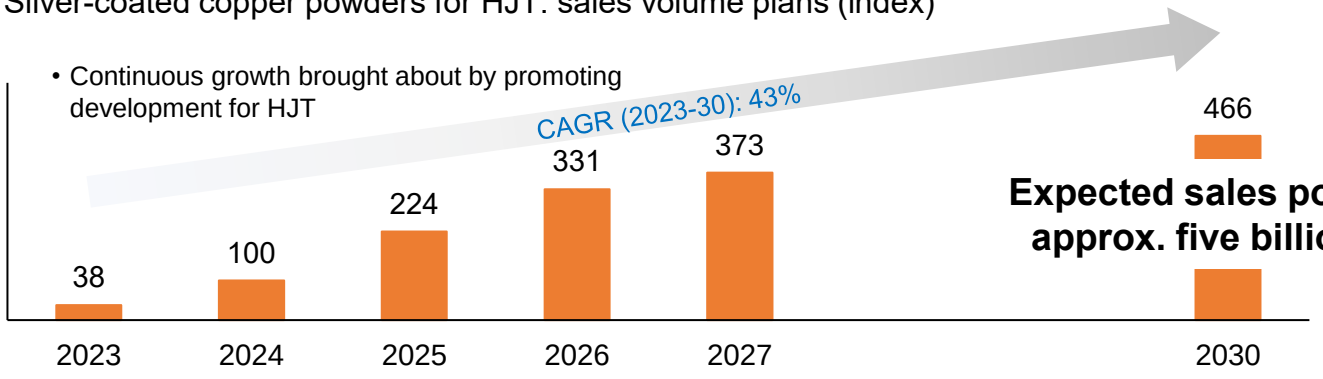
HJT market trends and sales plans for silver-coated copper powders for HJT

■ HJT market forecast: amount of power supply installed (index)*1

*1 Internal estimates



■ Silver-coated copper powders for HJT: sales volume plans (index)

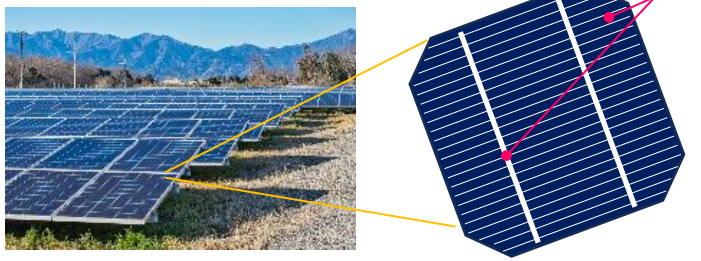


Expected sales potential: approx. five billion yen

Results | **Prospects and Plans**

HJT

Enlarged view



Silver-coated copper powders are used in electrodes.
Silver-coated copper powder paste is printed.

Share forecasts

Technology	2024	2030
Crystalline silicon solar cells		
PERC type	31%	5%
TOPCon type	58%	55%
HJT type	**6%**	**27%**
Others	5%	13%

- PERC type: PERC cells were previously mainstream solar cells, but they are not efficient and their share has been sharply decreasing.
- TOPCon type: highly efficient type
  Since TOPCon cells can be produced by using the manufacturing process for PERC cells, they will continue to remain as mainstream solar cells.
- HJT type: highly efficient type
  HJT cells are solar cells with higher performance than TOPCon cells and are **expected to expand their share as secondary mainstream solar cells.**

MITSUI KINZOKU

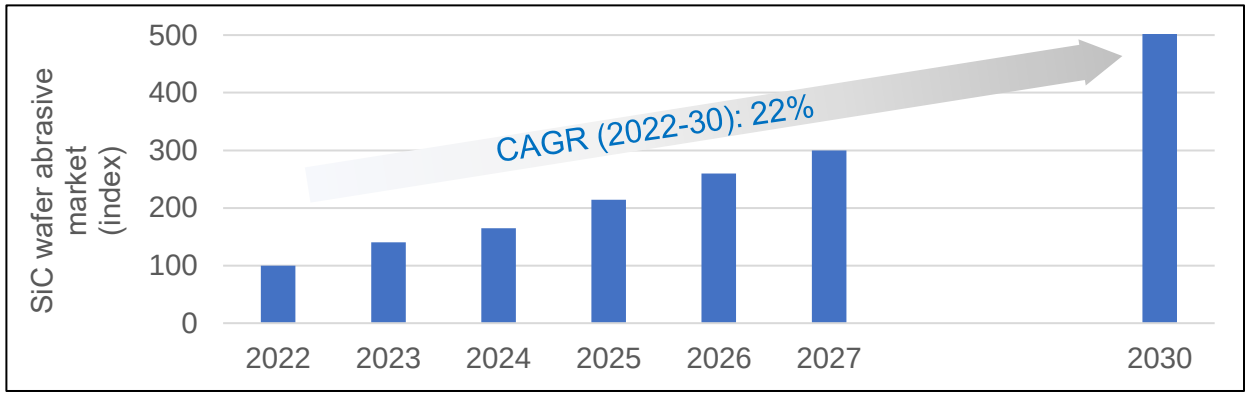
[New Product] (3): NANOBIX™, SiC Wafer Abrasive

We promote the well-being of the world through a spirit of exploration and diverse technologies.

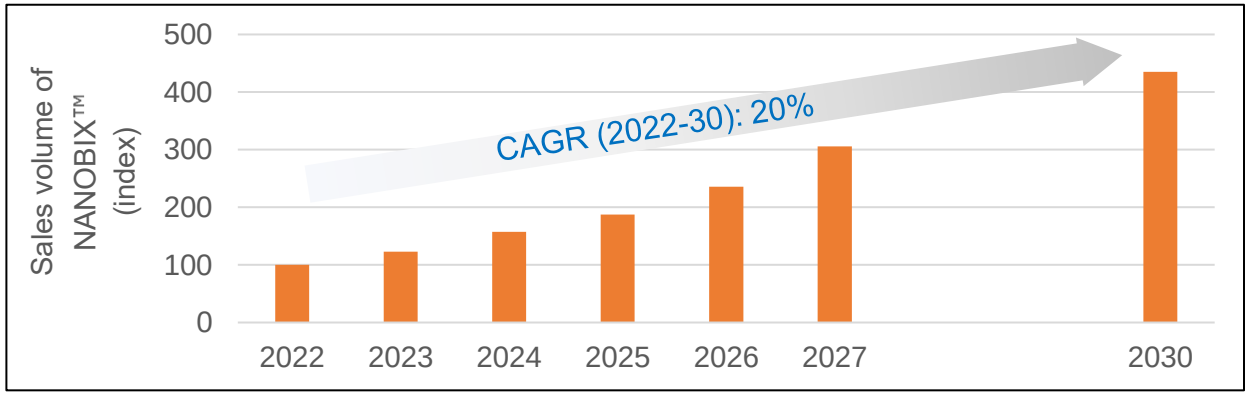
The sales of NANOBIX™ are expected to grow at the same rate as the growth of the SiC abrasive market to several hundred million yen in 2030. The sales volume in Japan has been increasing steadily. The sales volumes in China, U.S., and Europe are expected to expand going forward since we have gained footholds for entering the markets.

SiC wafer abrasive market trends and sales plans for NANOBIX™

■ SiC waver abrasive market forecast



■ Sales plans for NANOBIX™



* The market scale is an internal estimate.

Market's and our company's conditions

Expected sales and market scale in 2030

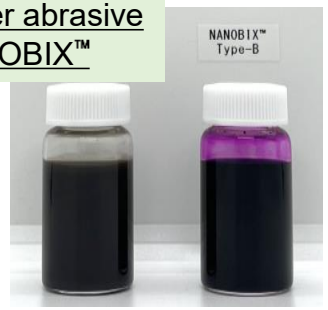
Expected sales potential: several hundred million yen

- SiC wafer abrasive market: 30 billion yen x estimated share: a few percent

Progress

- Japan: The product is **used by six companies**, and the sales volume has been gradually increasing.
- China and Taiwan: The product was **introduced by a new company**. We have started approaching leading Chinese SiC manufacturers and joined Taiwanese exhibitions.
- U.S. and Europe: We are considering routes to introduce the product to leading manufacturers.
- Our company: **The production capacity was increased to 50 tons/year** (announced in a 2023 press release).

SiC wafer abrasive NANOBIX™



SiC wafer

MITSUI KINZOKU

[New Products] (4): Copper Powder for Additive Manufacturing (5): Negative Thermal Expansion Powder

We promote the well-being of the world through a spirit of exploration and diverse technologies.

Copper Powder for Additive Manufacturing

Complex and highly thermal conductive modeling can be done by using general-purpose lasers.

Water-cooled cold plate

Rockets (engine chambers)

Expected sales and market scale in 2030

Expected sales potential: one billion to two billion yen

- Copper powders for additive manufacturing market: 33 billion yen x estimated share: 3% to 6%

Progress and future prospects

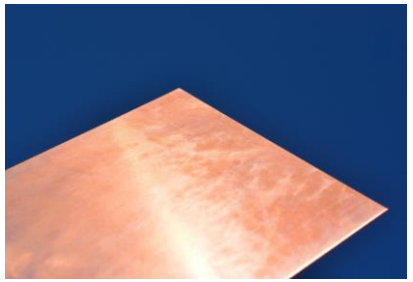
Actively open up new markets based on production technology, development capabilities, and customization accumulated through the development of copper powders for electronic materials

- Pure copper powders: Early entry into the binder jet market
- CuCr alloy: Application to microfabrication for water-cooled cold plates in data centers, aerospace, and automobiles

Negative Thermal Expansion Powder

The thermal expansion of resin or inorganic materials can be controlled by adding a small amount.

Copper clad laminate



Semiconductor encapsulation material

Expected sales and market scale in 2030

Expected sales potential: several hundred million to one billion yen

- Thermal control silica powder market: 150 billion yen x estimated share: up to 1%

Progress and future prospects

Search for a wide range of needs to be served by three types of materials with different characteristics

- Approval has been obtained from a company. The materials have been recognized from a number of customers in a wide range of markets, including semiconductors, substrate materials and resin components.
- We offer three types of material* and are actively calling attention to Mitsui's presence as a negative thermal expansion powder provider (we have participated in exhibitions in and outside Japan).

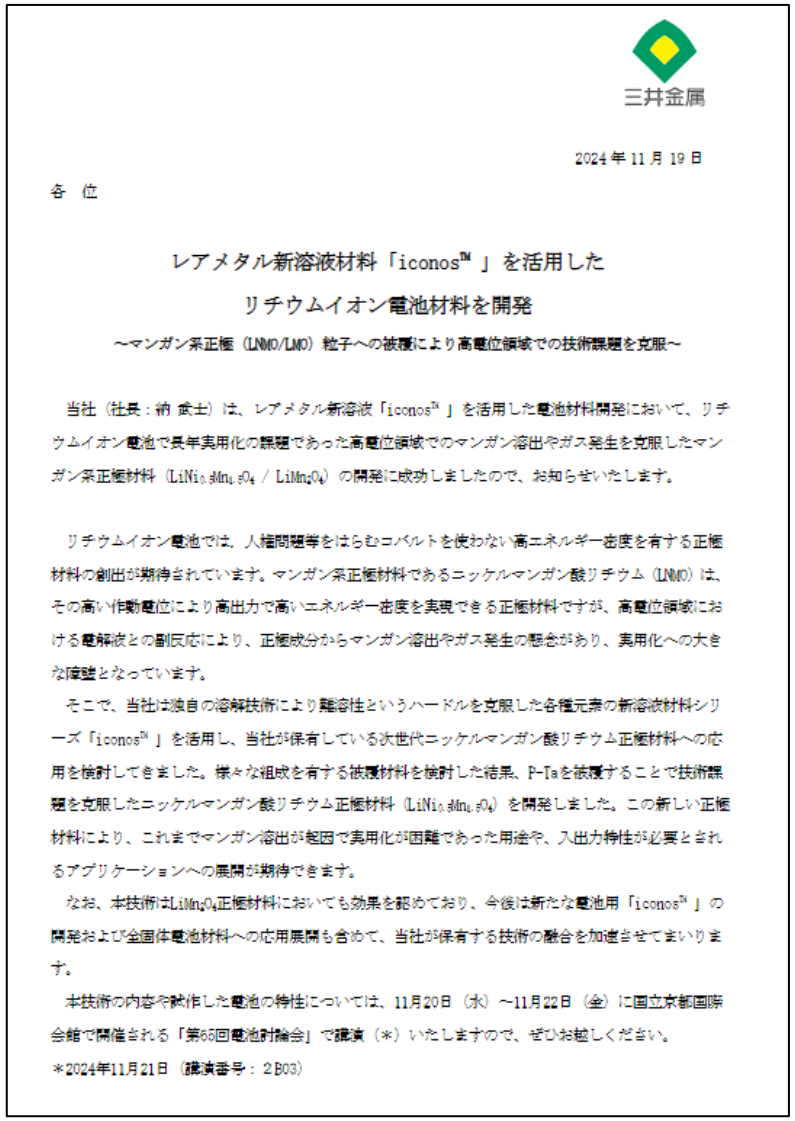
* Materials developed by Institute of Science Tokyo and Nagoya University

[The market scales are all internal estimates.]

Appendix

“Development of Lithium-Ion Battery Materials Using New Minor Metal Solutions iconos™”

We promote the well-being of the world through a spirit of exploration and diverse technologies.



三井金属

2024年11月19日

各 位

レアメタル新溶液材料「iconos™」を活用した
リチウムイオン電池材料を開発
～マンガン系正極（LNMO/LMO）粒子への被覆により高電位領域での技術課題を克服～

当社（社長：納 貞士）は、レアメタル新溶液「iconos™」を活用した電池材料開発において、リチウムイオン電池で長年実用化の課題であった高電位領域でのマンガン溶出やガス発生を克服したマンガン系正極材料（$LiNi_{0.5}Mn_{1.5}O_4$ / $LiMn_2O_4$）の開発に成功しましたので、お知らせいたします。

リチウムイオン電池では、人権問題等をはらむコバルトを使わない高エネルギー密度を有する正極材料の創出が期待されています。マンガン系正極材料であるニッケルマンガン酸リチウム（LNMO）は、その高い作動電位により高出力で高いエネルギー密度を実現できる正極材料ですが、高電位領域における電解液との副反応により、正極成分からマンガン溶出やガス発生の懸念があり、実用化への大きな障壁となっています。

そこで、当社は独自の溶解技術により難溶性というハードルを克服した各種元素の新溶液材料シリーズ「iconos™」を活用し、当社が保有している次世代ニッケルマンガン酸リチウム正極材料への応用を検討してきました。様々な組成を有する被覆材料を検討した結果、P-Taを被覆することで技術課題を克服したニッケルマンガン酸リチウム正極材料（$LiNi_{0.5}Mn_{1.5}O_4$）を開発しました。この新しい正極材料により、これまでマンガン溶出が起因で実用化が困難であった用途や、入出力特性が必要とされるアプリケーションへの展開が期待できます。

なお、本技術は$LiMn_2O_4$正極材料においても効果を認めており、今後は新たな電池用「iconos™」の開発および全固体電池材料への応用展開も含めて、当社が保有する技術の融合を加速させてまいります。

本技術の内容や試作した電池の特性については、11月20日（水）～11月22日（金）に国立京都国際会館で開催される「第65回電池討論会」で講演（＊）いたしますので、ぜひお越しください。

＊2024年11月21日（講演番号：2B03）

Content of the news release

By using new minor metal solutions iconos™ with our manganese-based positive electrode materials (LMO and LNMO), we succeeded in overcoming the technical issues of manganese elution and gas generation in high-potential areas.

Business advantage

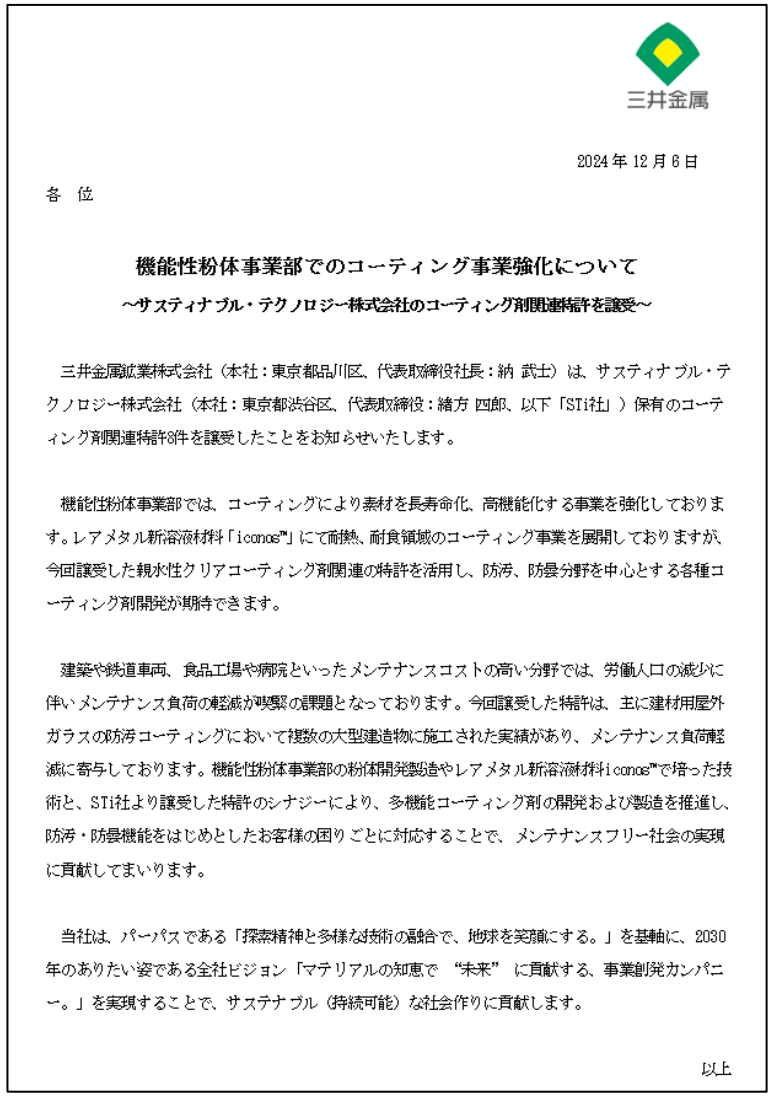
Highter output and higher energy density batteries can be produced without using cobalt, which is related to the resource production area issue and is a factor that increases battery costs. In particular, these batteries are expected to be used in applications where input/output is required.

Expected sales

Several hundred million yen (2030)

“Strengthening of the Coating Business in the Engineered Powders Division”

We promote the well-being of the world through a spirit of exploration and diverse technologies.



三井金属

2024年12月6日

各 位

機能性粉体事業部でのコーティング事業強化について

～サスティナブル・テクノロジー株式会社のコーティング剤関連特許を譲受～

三井金属鉱業株式会社（本社：東京都品川区、代表取締役社長：納 武士）は、サスティナブル・テクノロジー株式会社（本社：東京都渋谷区、代表取締役：緒方 四郎、以下「STi社」）保有のコーティング剤関連特許8件を譲受したことをお知らせいたします。

機能性粉体事業部では、コーティングにより素材を長寿命化、高機能化する事業を強化しております。レアメタル新溶液材料「iconos™」にて耐熱、耐食領域のコーティング事業を展開しておりますが、今回譲受した親水性クリアコーティング剤関連の特許を活用し、防汚、防曇分野を中心とする各種コーティング剤開発が期待できます。

建築や鉄道車両、食品工場や病院といったメンテナンスコストの高い分野では、労働人口の減少に伴いメンテナンス負荷の軽減が喫緊の課題となっております。今回譲受した特許は、主に建材用屋外ガラスの防汚コーティングにおいて複数の大型建造物に施工された実績があり、メンテナンス負荷軽減に寄与しております。機能性粉体事業部の粉体開発製造やレアメタル新溶液材料iconos™で培った技術と、STi社より譲受した特許のシナジーにより、多機能コーティング剤の開発および製造を推進し、防汚・防曇機能をはじめとしたお客様の困りごとに対応することで、メンテナンスフリー社会の実現に貢献してまいります。

当社は、パーパスである「探索精神と多様な技術の融合で、地球を笑顔にする。」を基軸に、2030年のありたい姿である全社ビジョン「マテリアルの知恵で “未来” に貢献する、事業創発カンパニー。」を実現することで、サステナブル（持続可能）な社会作りに貢献します。

以上

Content of the news release

We took over various patents of Sustainable Titania Technology Inc. related to coatings, including stain-resistant and anti-fogging coatings.

Business advantage

We expect the coatings of Sustainable Titania Technology Inc., which have been used in various large structures, to be an immediate asset to us. In addition, the synergistic effect of combining these coatings with our heat-resistant/corrosion-resistant coating business based on our new minor metal solutions iconos™ is expected to strengthen the business.

Expected sales

Several hundred million yen (2030)

Nippon Yttrium Co., Ltd.

Future Growth Potential and Creation of Synergy

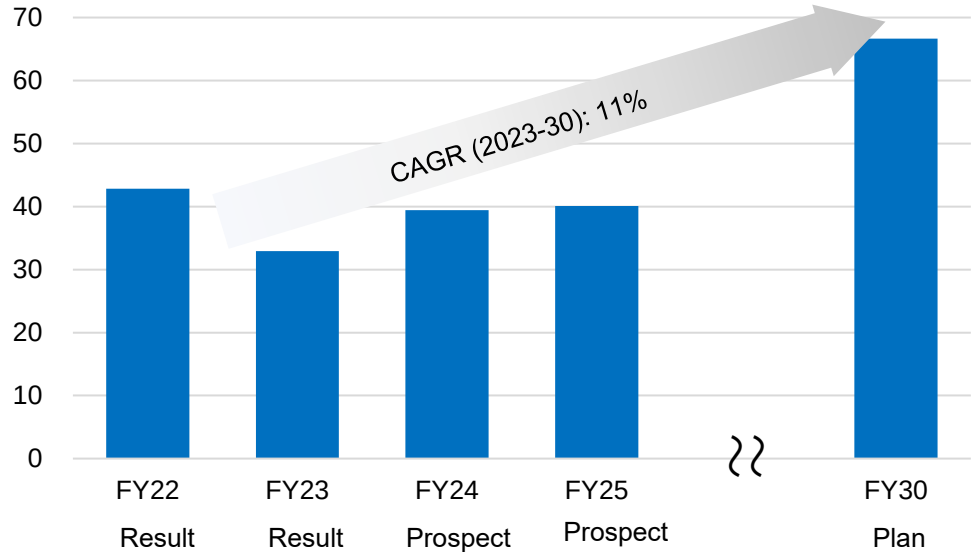
We promote the well-being of the world through a spirit of exploration and diverse technologies.

Nippon Yttrium Co., Ltd. is a rare all-around rare earth manufacturer in Japan that handles all rare earth elements ranging from light rare earths to heavy rare earths. We **acquired 100% ownership** of the company on March 1, 2024. This is intended to **increase business value by creating synergy** in the field of advanced materials between them and our engineered powder rare metal business related to their business. Activities have been carried out **smoothly** to create synergy since March 2024 and we are currently **accelerating** the deliberations for achieving synergy.

Growth potential of Nippon Yttrium

(In 100 million yen)

Sales results and prospects in Nippon Yttrium



They will maintain the world No. 1 position in the field of protective coating materials for semiconductor production equipment in 2030, and achieve business growth by offering differentiated products that precisely meet users' needs for electronic materials and materials in the field of medical care.

Efforts to create synergy

	Engineered Powders Division	Nippon Yttrium
Business fields	• Electronics • Electronic parts, batteries • Energy	• Semiconductor production equipment • Electronic parts, batteries • Medical care
Technology fields	• Technologies for manufacturing powders • Solvent extraction/solution technologies	• Solvent extraction/powder technologies • Ultra-high purification
Major products	• Rare metals • Metal powders	• Rare earths • Yttrium compounds

Specific activities to create synergy

- Efficiently recruit and utilize human resources
- Expand the aqueous solution business
- Improve the efficiency of recycling of rare earths*1
- Utilize idle facilities
- Expand and optimize opportunities to sell/purchase by sharing market/raw material information
- Reduce costs by integrating functions, etc.

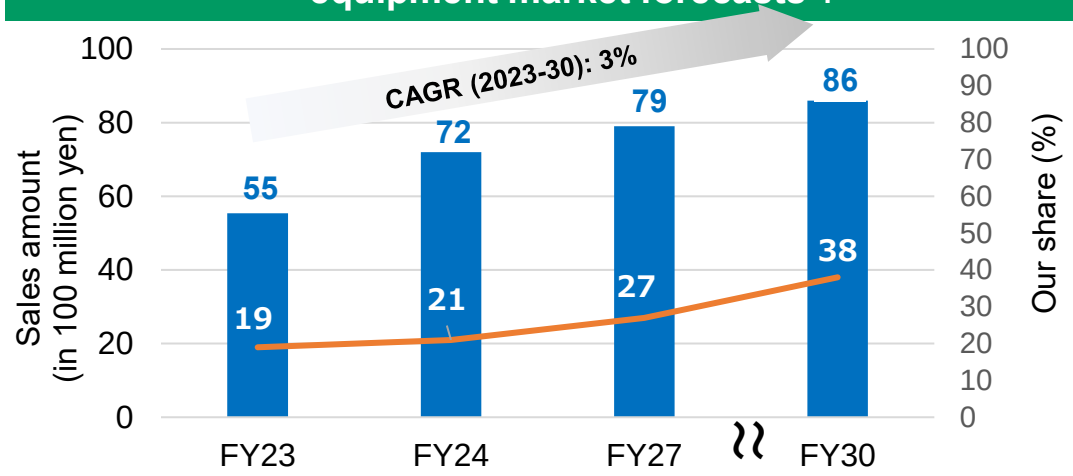
Accelerating deliberations for achieving synergy

*1: They have also been participating in a JOGMEC project (highly efficient solvent extraction PJ) since 2022.

Results and Prospects for Protective Coating Materials for Semiconductor Production Equipment

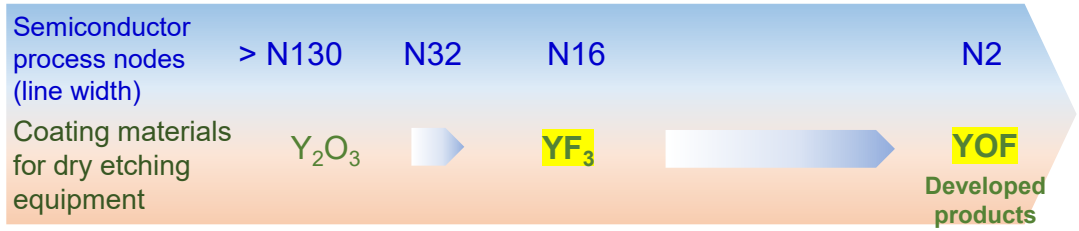
We promote the well-being of the world through a spirit of exploration and diverse technologies.

Protective coating materials for semiconductor production equipment market forecasts*1



Major applications: advanced logic and dry etching processes

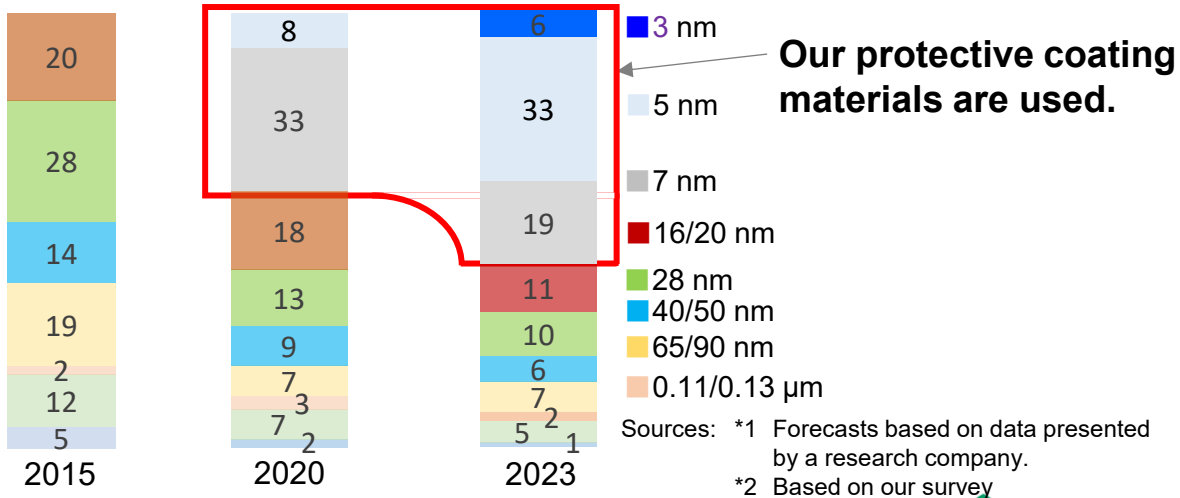
With the miniaturization of semiconductor process nodes, YF_3 and YOF*1, which are highly resistant to plasma, are gaining attention as coating materials for dry etching equipment*2.



With higher integration of semiconductor devices, demand for YF_3 and YOF has been expanding.

*1: Yttrium oxyfluoride
*2: Equipment used in a semiconductor production process to process unnecessary parts in semiconductors by using reactive gas or plasma

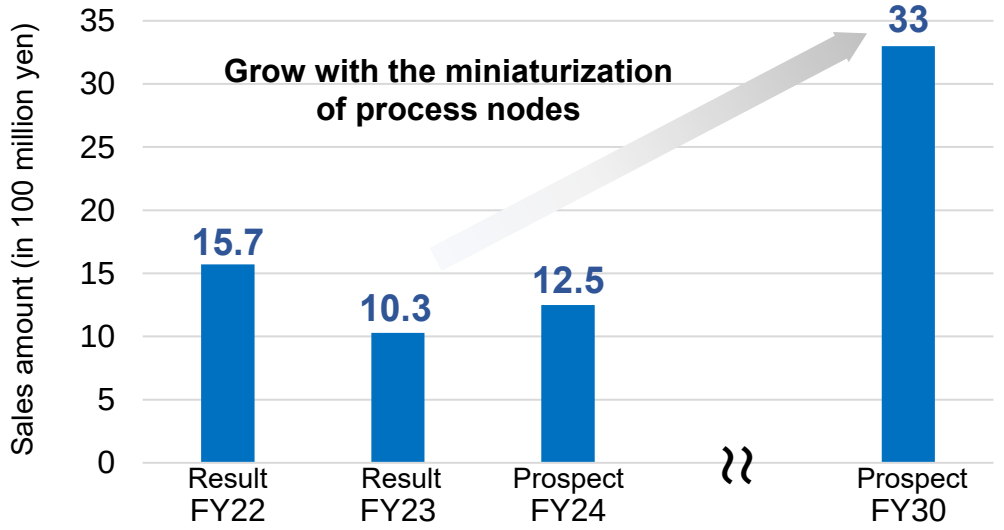
Semiconductor process node trends*2



Our protective coating materials are used.

Sources: *1 Forecasts based on data presented by a research company.
*2 Based on our survey

Sales results and prospects



Rare Earth Recycling Business

We promote the well-being of the world through a spirit of exploration and diverse technologies.

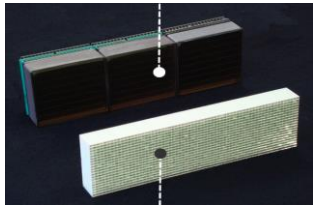
Recycling business

They recycle the following heavy rare earths, which are scarce and important elements of the 17 rare earths: **Gd, Tb, Dy and Lu**

TheyをWeに変える？

Gd and Lu

Scintillator crystals such as LYSO and GSO



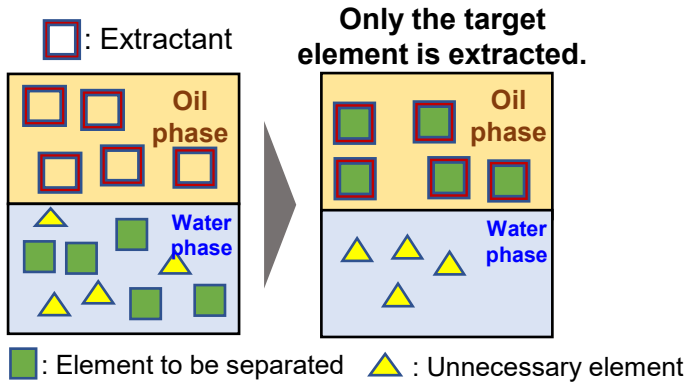
Tb and Dy

Additives for high-performance magnets (Nd-Fe-B)

Adding Tb or Dy makes them heat resistant.

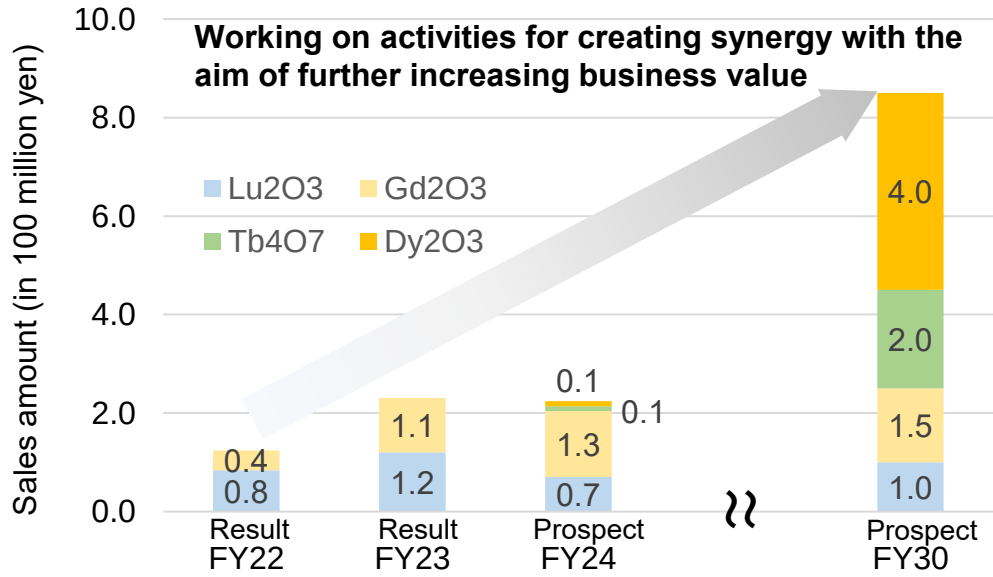
Our strengths and solvent extraction method

The solvent extraction method is the process of mixing an aqueous solution in which various elements are dissolved with an organic solvent (oil) containing an extractant in order to extract certain elements.
Certain rare earth elements can be separated and refined to a high purity.
In order to **establish a new solvent extraction technology**, we are participating in the **highly efficient solvent extraction project of the JOGMEC.**



Solvent extraction line

Sales results and prospects for recycling



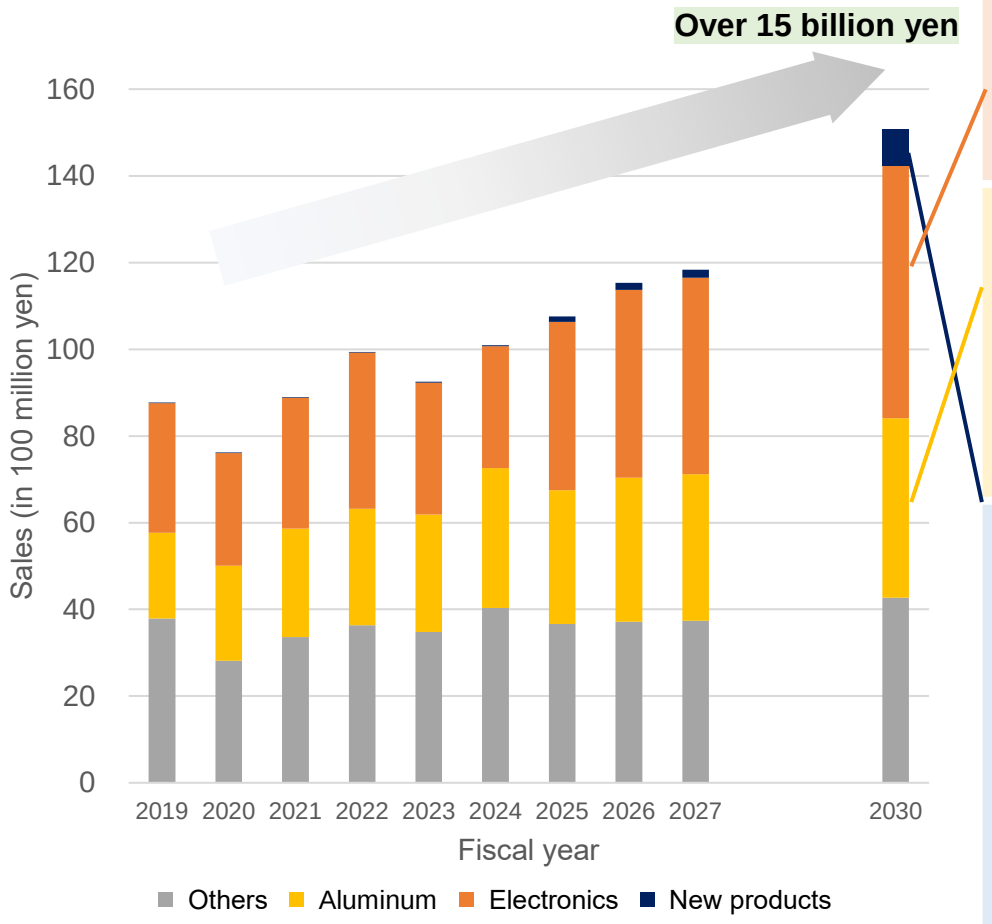
MITSUI KINZOKU

Ceramics Division

Ceramics Division – Vision for 2030

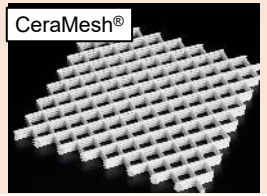
We have been earning customers' trust by turning their needs into a reality in a timely manner. We aim to achieve sales of over 15 billion yen in 2030 by taking advantage of this strength.

Changes in sales



Our product lines

Setter for electronic parts)
(tool for firing)



Filter for aluminum

[New products]
•Additive manufacturing
•TaC coating

Related markets

MLCC

Aluminum cans
Smartphones
Automobiles

Semiconductors
Medical care
Aerospace

Growing Market (1): Setter for Firing MLCC

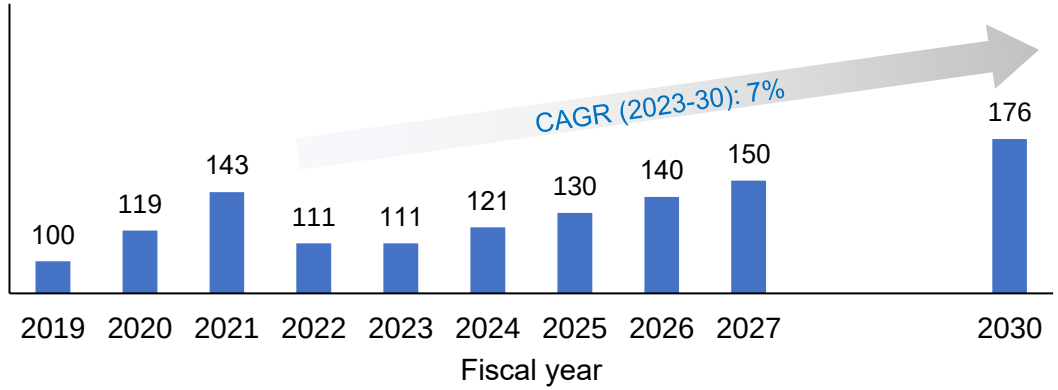
We promote the well-being of the world through a spirit of exploration and diverse technologies.

The mesh setter for firing that was developed based on our own technology (CeraMesh®) contributes to the miniaturization of MLCC.

MLCC market forecasts and sales plans

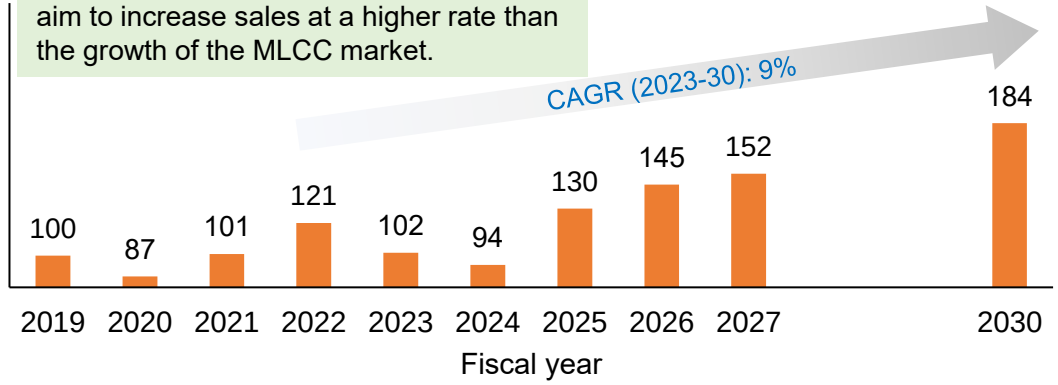
■ MLCC market forecasts: unit sales (index)*1

*1 Internal estimates

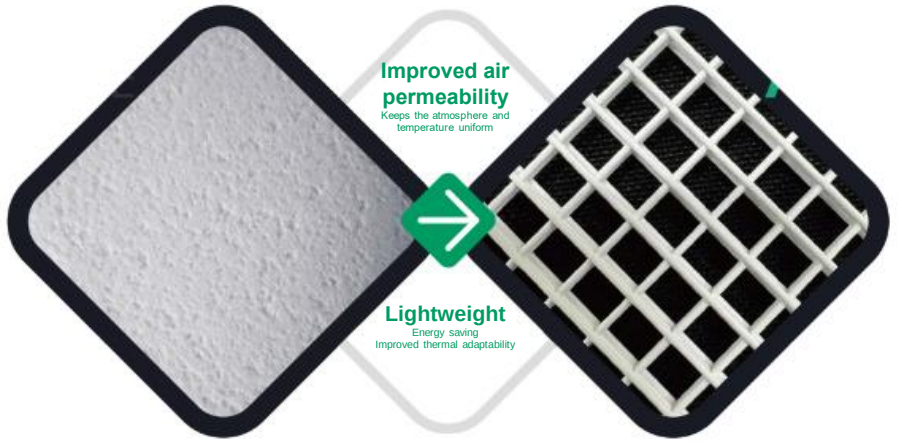


■ Setters for firing electronic parts: sales plans (index)

By expanding the sales of CeraMesh®, we aim to increase sales at a higher rate than the growth of the MLCC market.



Market trends and product characteristics



Strong points of our product (CeraMesh®)

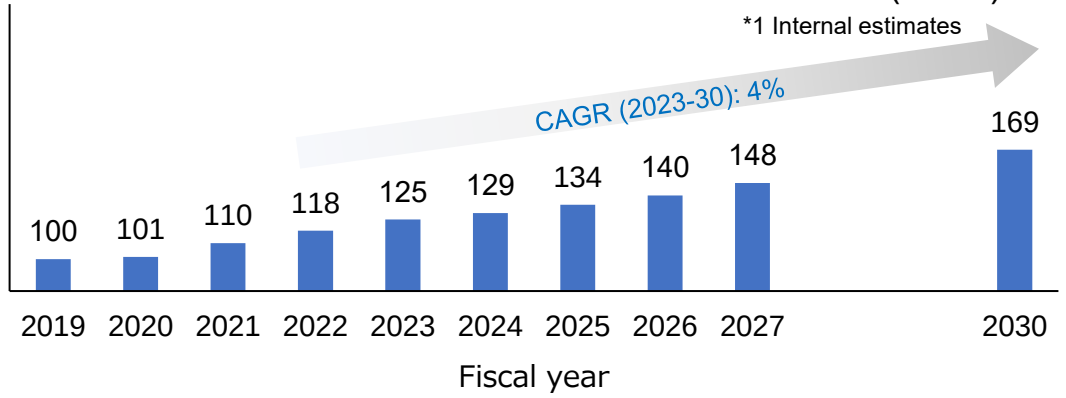
- The mesh structure improves thermal uniformity, which reduces the unevenness of the MLCC quality and helps to improve productivity.
- Since the product is 60% lighter than conventional products, it can be heated rapidly and contributes to energy conservation.
- Surface treatment, such as coating or thermal spraying, reduces its reaction with parts to be fired.

Growing Market (2): Precision Filter for Quality Aluminum

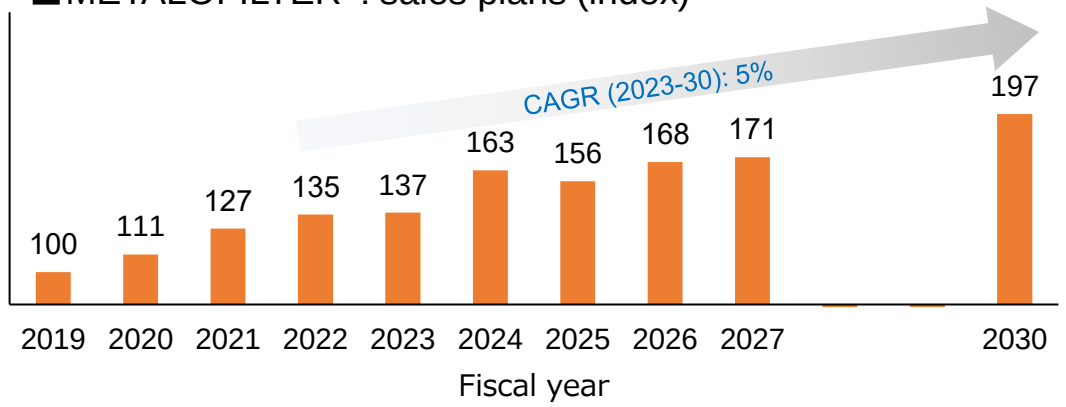
In the future, the recycling of aluminum cans will further increase and they will become increasingly thin. Our precision filter contributes to promoting these trends.

Aluminum can market forecasts and sales plans

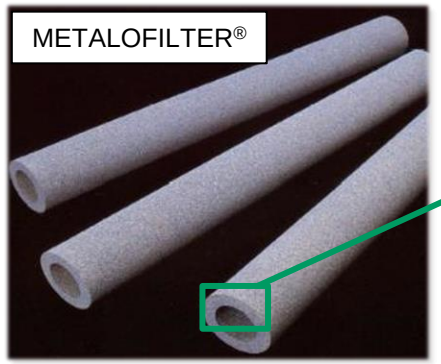
■Global aluminum can market forecasts: unit sales (index)*1

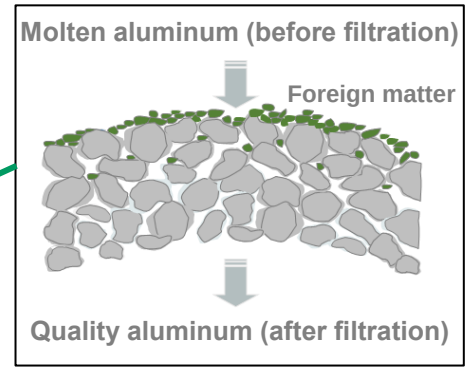


■METALOFILTER®: sales plans (index)



Market trends and product characteristics





Strong points of our product (precision filter)

- Our filters are used in almost all can materials in Japan and they have a large share of the global precision filtration market.
- The product is manufactured in Japan (Omuta) and China (Suzhou), and the two-location operation system serves as a quick delivery and BCP system.
- We also manufacture ancillary facilities for the aluminum casting process and help customers with all aspects of their aluminum processing processes.

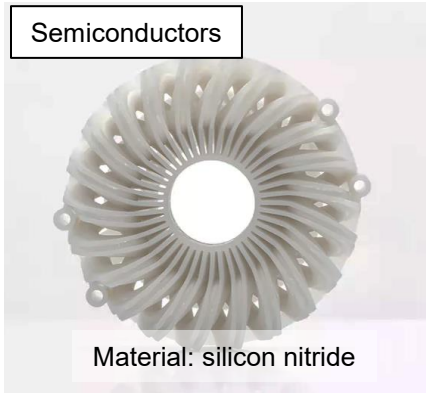
Newly Developed Products

With the aim of expanding into new business fields, we are developing ways to apply our technologies.

We promote the well-being of the world through a spirit of exploration and diverse technologies.

Additive manufacturing for ceramics

Supply fine ceramics with high-precision and complex shapes with short lead times



Expected sales and market scale in 2030

Expected sales potential: over five hundred million yen

- Additive manufacturing market scale: 50 billion yen
- CAGR (2023/2030): 36%

Topic

- Started entrusted 3D printing services in collaboration with AS ONE Corporation and Lithoz GmbH (Austria)

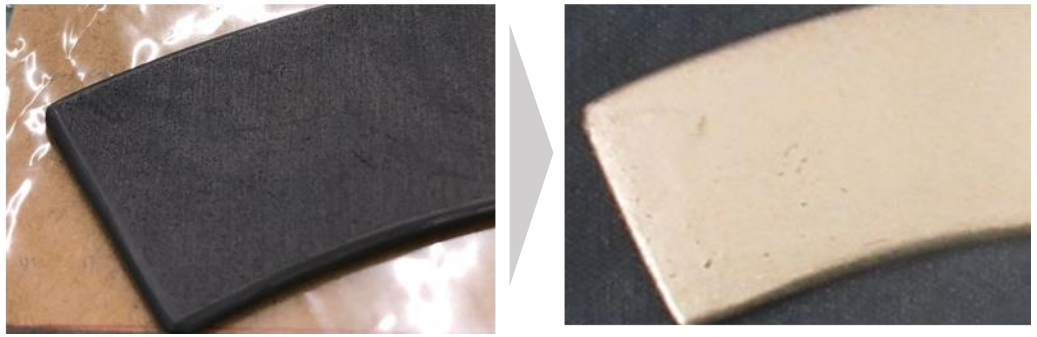
* Press release dated April 21, 2024

“Started Accepting 3D Printing Services for Fine Ceramics”
—New functions and values added by fine ceramics with delicate and complex design—

TaC coating

Reduce costs and environmental burdens in the SiC power semiconductor production process

Carbon base material **TaC coating**



Expected sales and market scale in 2030

Expected sales potential: over three hundred million yen

- TaC coating market scale: 15 billion yen
- CAGR (2023/2030): 18%

Topic

- Concluded a license agreement on TaC coating technology with TOYOTA CENTRAL R&D LABS., INC.

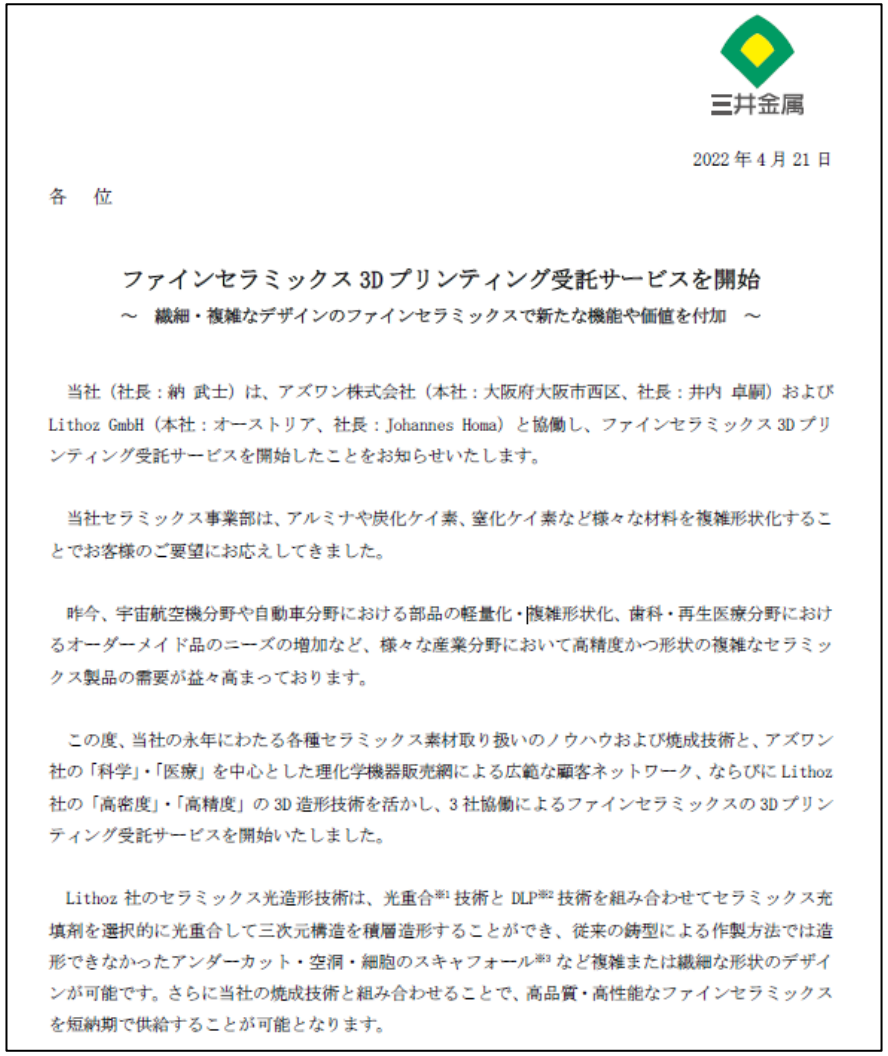
* Press release dated November 27, 2024

“Conclusion of a License Agreement on TaC Coating Technology with TOYOTA CENTRAL R&D LABS., INC.”
—For reducing costs and environmental burdens in the SiC power semiconductor production process—

Appendix

“Started Accepting 3D Printing Services for Fine Ceramics”

We promote the well-being of the world through a spirit of exploration and diverse technologies.



三井金属

2022 年 4 月 21 日

各　位

ファインセラミックス 3D プリンティング受託サービスを開始

～　繊細・複雑なデザインのファインセラミックスで新たな機能や価値を付加　～

当社（社長：納 武士）は、アズワン株式会社（本社：大阪府大阪市西区、社長：井内 卓嗣）および Lithoz GmbH（本社：オーストリア、社長：Johannes Homa）と協働し、ファインセラミックス 3D プリンティング受託サービスを開始したことをお知らせいたします。

当社セラミックス事業部は、アルミナや炭化ケイ素、窒化ケイ素など様々な材料を複雑形状化することでお客様のご要望にお応えしてきました。

昨今、宇宙航空機分野や自動車分野における部品の軽量化・複雑形状化、歯科・再生医療分野におけるオーダーメイド品のニーズの増加など、様々な産業分野において高精度かつ形状の複雑なセラミックス製品の需要が益々高まっております。

この度、当社の永年にわたる各種セラミックス素材取り扱いのノウハウおよび焼成技術と、アズワン社の「科学」・「医療」を中心とした理化学機器販売網による広範な顧客ネットワーク、ならびに Lithoz 社の「高密度」・「高精度」の 3D 造形技術を活かし、3 社協働によるファインセラミックスの 3D プリンティング受託サービスを開始いたしました。

Lithoz 社のセラミックス光造形技術は、光重合※1 技術と DLP※2 技術を組み合わせてセラミックス充填剤を選択的に光重合して三次元構造を積層造形することができ、従来の鋳型による作製方法では造形できなかったアンダーカット・空洞・細胞のスキャフォール※3 など複雑または繊細な形状のデザインが可能です。さらに当社の焼成技術と組み合わせることで、高品質・高性能なファインセラミックスを短納期で供給することが可能となります。

Content of the news release

"Launch of Fine Ceramics 3D Printing Contract Services"
- It allows our customers to achieve new levels of functionality and value with finely detailed and complex designs.-

Business advantage

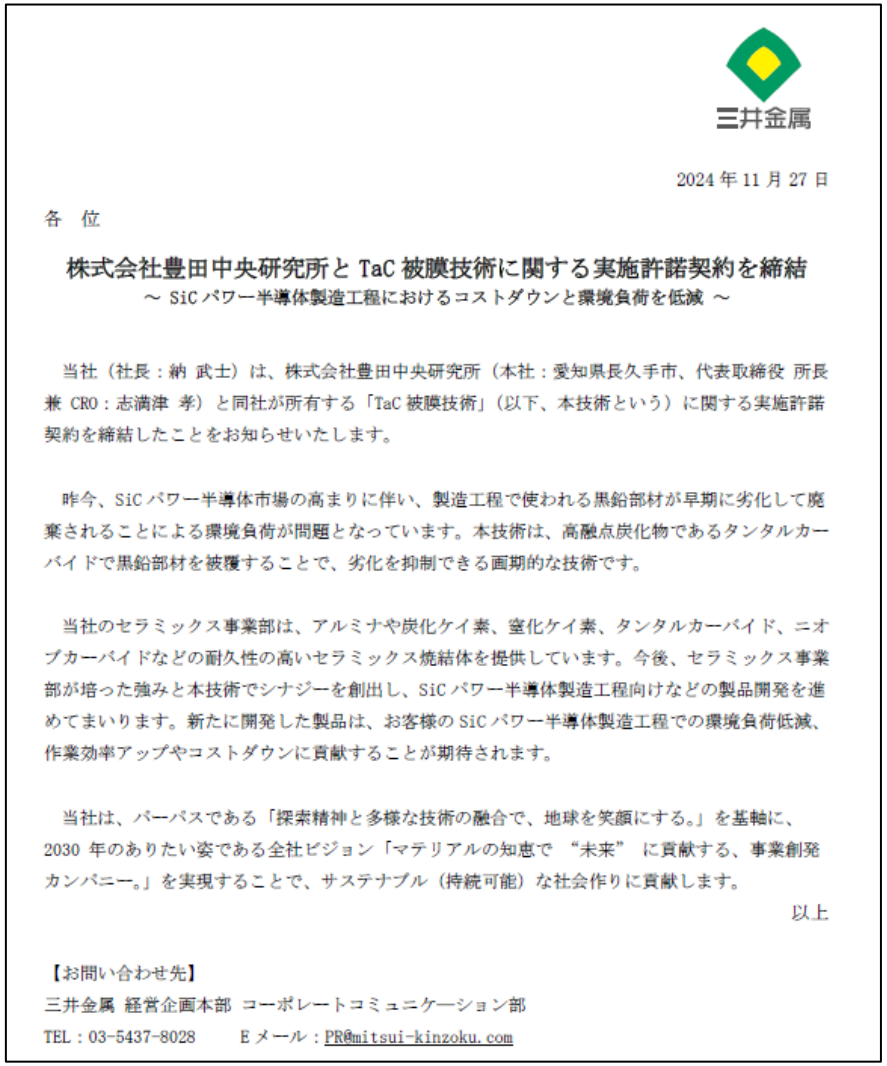
By combining high-density and high-precision additive manufacturing technology with our firing technology, we can supply high-quality, high-performance fine ceramics with short lead times.

Expected sales

Over five hundred million yen (2030)

“Conclusion of a License Agreement on TaC Coating Technology with TOYOTA CENTRAL R&D LABS., INC.”

We promote the well-being of the world through a spirit of exploration and diverse technologies.



三井金属

2024 年 11 月 27 日

各　位

株式会社豊田中央研究所と TaC 被膜技術に関する実施許諾契約を締結
～ SiC パワー半導体製造工程におけるコストダウンと環境負荷を低減 ～

当社（社長：納 武士）は、株式会社豊田中央研究所（本社：愛知県長久手市、代表取締役 所長兼 CRO：志満津 孝）と同社が所有する「TaC 被膜技術」（以下、本技術という）に関する実施許諾契約を締結したことをお知らせいたします。

昨今、SiC パワー半導体市場の高まりに伴い、製造工程で使われる黒鉛部材が早期に劣化して廃棄されることによる環境負荷が問題となっています。本技術は、高融点炭化物であるタンタルカーバイドで黒鉛部材を被覆することで、劣化を抑制できる画期的な技術です。

当社のセラミックス事業部は、アルミナや炭化ケイ素、窒化ケイ素、タンタルカーバイド、ニオブカーバイドなどの耐久性の高いセラミックス焼結体を提供しています。今後、セラミックス事業部が培った強みと本技術でシナジーを創出し、SiC パワー半導体製造工程向けなどの製品開発を進めてまいります。新たに開発した製品は、お客様の SiC パワー半導体製造工程での環境負荷低減、作業効率アップやコストダウンに貢献することが期待されます。

当社は、パーパスである「探索精神と多様な技術の融合で、地球を笑顔にする。」を基軸に、2030 年のありたい姿である全社ビジョン「マテリアルの知恵で “未来” に貢献する、事業創発カンパニー。」を実現することで、サステナブル（持続可能）な社会作りに貢献します。

以上

【お問い合わせ先】
三井金属 経営企画本部 コーポレートコミュニケーション部
TEL：03-5437-8028　　E メール：PR@mitsui-kinzoku.com

Content of the news release

“Entered into a license agreement with Toyota Central R&D Labs., Inc. for TaC coating technology.”
—For reducing costs and environmental burdens in the SiC power semiconductor production process—

Business advantage

We will combine the strengths of the Ceramics Division with this technology to create synergy and develop products for the SiC power semiconductor production process and other new products.
These new products are expected to help customers to reduce environmental burdens and costs and increase work efficiency in their SiC power semiconductor production process.

Expected sales

Over three hundred million yen (2030)