

WITH MATERIALS

MITSUBISHI MATERIALS communication magazine

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SPECIAL FEATURE

SUPPORTING THE EVOLUTION OF AUTOMOBILES AND SEMICONDUCTORS



For more information on
Medium-Term Management
Strategy 2031,
please see our website.



SPECIAL FEATURE SUPPORTING THE EVOLUTION OF AUTOMOBILES AND SEMICONDUCTORS

Mitsubishi Materials has set “Our Commitment” of “For people, society and the earth, circulating resources for a sustainable future” in its Medium-term Management Strategy (“FY2031 Strategy”). “Expansion of resource recycling” and “enhancing the supply of high-performance materials and products” are important initiatives to achieve this goal.

In this issue, we will cover high-performance materials and products, which are widely used for automobiles and electronic devices and maximize their performance. Today, we are witnessing the transition to xEVs (electric vehicles) as well as electrification and IoT implementation to make goods and services work efficiently, toward the realization of a sustainable society. Mitsubishi Materials will adapt to these societal changes through the power of high-performance materials and products.

Accelerated electrification and the reduction of ICE vehicles

The EU has approved a law to effectively end the sale of ICE (internal combustion engine) vehicles in 2035. According to the International Energy Agency (IEA), EVs accounted for 10% of the total new cars sold worldwide as of December 2022. The electrification of vehicles is accelerating.

Connected and self-driving cars are coming true

Driverless self-driving taxi services have already been commercialized in the United States and China. In Japan, fully automated driving within specific areas (referred to as “level-4” autonomous driving) was approved by a law revision in April 2023. The self-driving technology we have dreamed of is gradually becoming a reality.

Into an era where everything is connected

In 2025, the world is expected to contain 180 trillion gigabytes of data. This enormous volume of data results from the transformation of equipment that was previously not connected to the internet into IoT devices with advanced capabilities. Data has become an essential part of our societal infrastructure.

Into an era where AI is utilized in every scene

AI is part of our daily lives, supporting society by discerning defective products at plants, forecasting supply and demand balances for products and services, and supporting cancer diagnoses based on images of affected areas.

High-performance Products Help Advance Automobiles and Semiconductors

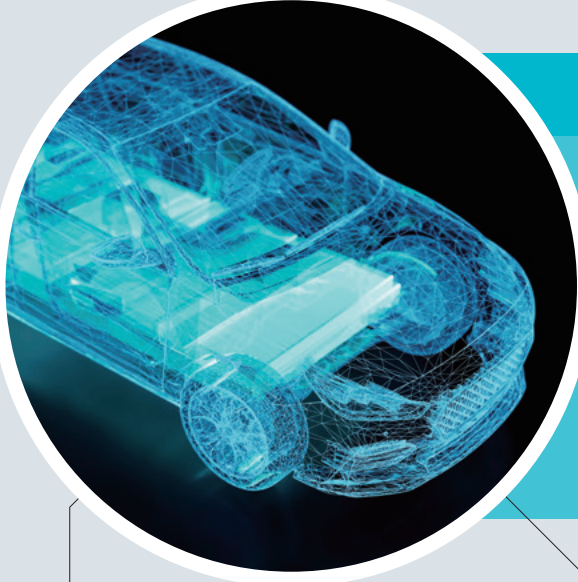
The evolution of next-generation vehicles and electronic devices is remarkable. Regarding semiconductors, which control their motion, and the components and parts through which electricity flows, materials and products are required to be more precise than ever and capable of functioning under severe conditions. In other words, the advancement of materials is essential for the evolution of automobiles and electronic devices. Mitsubishi Materials supports this evolution by developing and manufacturing high-performance products with a wide range of features.



Copper & Copper Alloy Business

Lead-free brass with excellent machinability (GloBrass®)

GloBrass®, a type of free-cutting brass*1 that does not contain environmentally hazardous substances, excels in both strength and machinability. It is expected to find use in faucet fittings, such as water meters, thanks to its eco-friendly and people-friendly qualities complying with Europe's ELV directive,*2 RoHS directive,*3 and water quality standards. Given that the material meets the necessary conductivity requirements for electronic and electrical equipment and offers corrosion resistance on par with conventional brass, it is expected to be used in a wide range of applications, including mechanical components in automobiles.



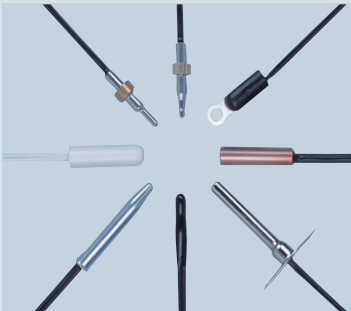
Automobiles

Since xEVs use a significant amount of electricity for power and electronic control, the materials used in them must demonstrate conductivity and heat dissipation properties in all environments. Mitsubishi Materials tackles this challenge through high-quality copper products and alloy metal technology.

Copper & Copper Alloy Business

Oxygen-free copper (MOFC®-HR)

Automotive components for next-generation EVs require materials that can withstand higher current flow and heat dissipation than those for conventional internal combustion cars. This is where Mitsubishi Materials' MOFC®-HR, innovative oxygen-free copper with world-class strength and heat resistance, comes into play. This material achieves strength and heat resistance on par with copper alloys, while retaining the excellent electrical and heat conductivity of conventional oxygen-free copper. The material is expected to be used for components such as automotive high-voltage terminals and busbar modules, which need to support high current flow, dissipate heat effectively, and meet compact and thin size requirements.



Electronic Materials and Components Business (Electronic Components)

Semiconductors

Semiconductors control and manage memory in various electronic devices. The completion of integrated circuits (ICs) and central processing units (CPUs), which serve as the brain of computers, involves a wide range of processes. These include not only manufacturing the underlying materials but also creating equipment for manufacturing semiconductor components. Mitsubishi Materials develops and produces materials and processed products used in various applications related to semiconductors.

Thermistor sensor

Heat management is essential to maintain the functioning of smartphones, which include semiconductors, as well as next-generation vehicles. With an increase in the number of integrated electronic components due to product performance improvements, managing the heat emitted by these components has become crucial. This is where thermistor sensors, which function as temperature sensors, come into action. Mitsubishi Materials' thermistor sensors provide high-speed responsiveness, high reliability, and high precision in temperature sensing thanks to the proprietary raw materials. Additionally, their structures and forms can be customized to meet various requirements.



Electronic Materials and Components Business (Advanced Materials)

Processed silicon products

Processed silicon products play an active role as part of semiconductor manufacturing equipment. Mitsubishi Materials provides silicon products by precisely processing high-purity silicon to ensure that semiconductor manufacturing equipment functions properly.



Electronic Materials and Components Business (Electric Cables)

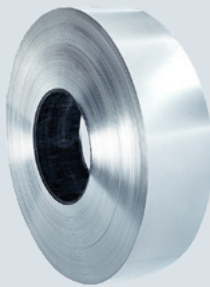
Sealing products

Some semiconductor manufacturing equipment, such as CVD equipment used to form thin films for protecting semiconductors from water and dust, operates in a plasma*4 environment and needs to withstand it. For this purpose, Mitsubishi Cable Industries, Ltd.'s sealing products are useful. Apart from plasma resistance, the products also prevent the ingress of dirt and dust, which can adversely affect the equipment, and provide antistatic and abrasion resistance. Further product development is ongoing to support various environmental regulations.

Copper & Copper Alloy Business

Copper strip for automotive terminals and busbars (MSP series)

The MSP series, widely used for automotive terminals and busbars, are copper alloys that offer both superior electrical conductivity and strength. The materials are suitable for a wide range of applications in next-generation automobiles that incorporate many electronic devices. MSP5, which contains the highest magnesium content among the alloys in the series, excels in strength, heat resistance, and bendability while meeting the needs for compactness and lightness. When combined with our PIC (Precise Interface Control) Plating technology, it can significantly reduce friction during the insertion of terminals in automotive connectors, and so on. This material also contributes to advancing their functionalities.

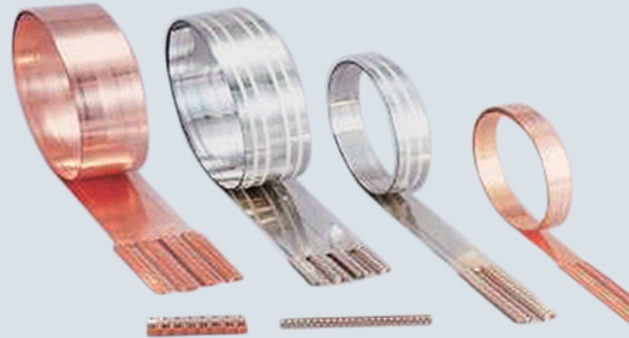


Electronic Materials and Components Business (Advanced Materials)



Solder materials with low alpha-ray emissions

The solder material bonds a silicon chip and substrate, which form the circuitry of a semiconductor component, and serves as the electrode between them. Conventional solder materials emitted alpha rays, which could cause software errors that overwrite stored data. This is why Mitsubishi Materials has started offering plating chemicals and anodes, which are solder materials with extremely low alpha-ray emissions.



Copper & Copper Alloy Business

Copper alloys for lead frames

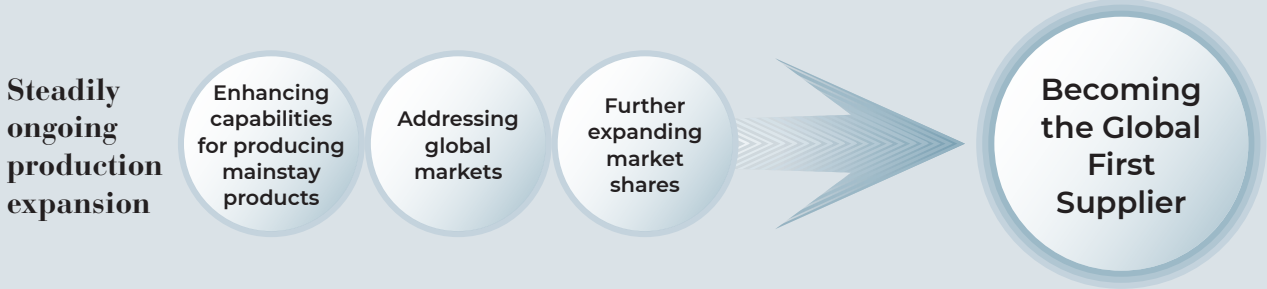
Lead frames are thin metal plates used for ICs, serving as connecting terminals when ICs are attached and integrated into printed wiring boards. The advancement of the components is supported by our copper alloys for lead frames, which boast a world-class quality achieved through our long-cultivated precision rolling technology. These alloys are widely employed as lead frame materials, harnessing the optimal balance of strength and conductivity, heat resistance, ease of pressing, and bendability.

*1 Brass: An alloy of copper and zinc. *2 ELV (End-of-Life Vehicles) directive: A directive set by the EU with the aim of reducing environmental impacts of wasted vehicles. *3 RoHS directive: A directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

*4 Plasma: The fourth state of matter following solid, liquid, and gas. In this state, atoms and molecules in the gas are ionized, splitting into positively charged ions and negatively charged electrons.

Providing Products That Support Next-Generation Technology, Worldwide

The transition to xEVs and the demand for semiconductor-related products are expanding on a global basis. To meet these market needs, Mitsubishi Materials is strengthening production expansion systems of related products at each manufacturing site.



Copper & Copper Alloy Business	Electronic Materials and Components Business
Increasing current production by 30% by enhancing facilities at each plant	Enhancing the system for producing components of semiconductor manufacturing equipment
<div>Sakai Plant, Mitsubishi Materials (Osaka) Operation began in July 2023</div> <div>Enhancing casting facilities We enhanced the casting facilities of the plant to improve the system for producing copper billets and cakes, which are raw materials of wrought copper products.* Through this initiative, we will increase the production volume of copper billets and cakes. <small>*Wrought copper products: A group of products that have been processed from copper, brass, bronze, and copper alloys into plates, strips, tubes, rods, and wires.</small></div> <div><div>ProductCopper billets and cakes</div><div>Materials to produce wrought copper materials, such as copper tubes, rods, plates, and strips. Cakes with a square surface are suitable for plates and strips, while billets with a round surface are for tubes and rods.</div><div></div></div> <div><div>Sambo Plant, Mitsubishi Materials (Osaka) Operation to begin in August 2024</div><div>Installment of cleaning machines, slitters, and packing machines We will increase the production volume of rolled products by installing new cleaning machines, slitters, and other equipment. This will allow us to meet the growing demand for processed copper products due to the expansion of the xEV market.</div><div>Wakamatsu Plant, Mitsubishi Materials (Fukushima) Operation to begin in May 2024</div><div>Installing slitters and packing machines and enhancing tin reflow soldering lines We will increase the production volume of rolled products by installing new facilities, such as slitters and packing machines. This will allow us to meet the growing demand for processed copper products used in automotive and other applications.</div><div><div>ProductCopper plates and strips</div><div>These products are made by rolling copper cakes into forms of plates and sheets. Mitsubishi Materials boasts the top market share in Japan.</div><div></div></div></div>	<div>Mitsubishi Materials Electronic Chemicals Co., Ltd. (Akita) Operation to begin in 2024</div> <div>Increasing the production volume of materials for replacement parts for semiconductor manufacturing equipment We will expand the production of columnar crystal silicon and increase the number of produced ingots by 1.3 times by 2026 compared to 2021.</div> <div><div>ProductColumnar crystal silicon</div><div>Used as a material for components in semiconductor manufacturing equipment. Columnar crystal silicon excels in strength, machinability, and bendability, making it easy to process into various forms, including rings.</div><div></div></div> <div><div>Kumagaya Works, Mitsubishi Cable Industries, Ltd. (Saitama) Operation began in September 2023</div><div>Production expansion of sealing products for semiconductor manufacturing equipment By expanding the production volume through renovation of existing facilities and construction of clean rooms, we will aim to increase the sales of sealing products for semiconductor manufacturing equipment by about 1.5 times by 2025 compared to the sales in 2021.</div><div><div>ProductSealing products</div><div>These are produced for dry etching equipment, etc. used for semiconductor manufacturing. In addition to plasma resistance, they stand out in being free of PFOA, an organic fluorine compound, whose content amounts are governed by the EU REACH Regulation.* <small>*REACH Regulation: Regulations on the registration, evaluation, authorization, and restriction of chemicals set by the EU.</small></div><div></div></div></div>



Sakai Plant Contributing to next-generation technologies by enhancing the production system and technical capabilities

With the advancement of vehicle electrification and the dissemination of the 5G communication system, there is a growing demand for processed copper products, such as automotive terminals and heat dissipation electronic parts. To contribute to the development of technologies for the next generation, Mitsubishi Materials is taking efforts to strengthen the system for producing copper billets and cakes, which are raw materials of the above products.

The Sakai Plant has been enhancing its casting facilities with the goal of increasing production volume from its current state. However, simply enhancing facilities is not enough to achieve this goal. It is necessary to analyze and improve four elements: plant employees, machines, materials, and methods. Collaboration with other plants and divisions is also essential. This is because the production system can be strengthened by aligning production with the sales department and the Sambo Plant, which handles secondary processing, and by aiming to optimize operations and inventories.

Therefore, looking ahead to facility enhancement, the Sakai Plant has been working on increasing the operating rate of existing lines for a few years, while having close discussions with the Sambo Plant and other relevant organizations to share each other's operational procedures and enhancing collaboration. This has improved the operating rate of existing lines and established a system that maximizes the abilities of each site. Considering the utilization of DX to build a more efficient production system, the plant will further expand its production volume.

By steadily implementing initiatives to enhance its production system, the Sakai Plant will contribute to the realization of a prosperous society through the advancement of next-generation technologies.

FY2031 Strategy

My Challenge

Takashi Sonohata
Manager
Copper Billets and Cakes Dept.,
Manufacturing Div.
Sakai Plant
Advanced Products Company

Creating high-quality copper using long-cultivated dissolution and casting technologies

One of the strengths of the Sakai Plant lies in its utilization of long-cultivated dissolution and casting technologies to mass-produce oxygen-free copper with an extremely low oxygen concentration. Generally, copper faces an issue known as hydrogen embrittlement, where it becomes fragile when heated in an atmosphere containing hydrogen. Oxygen-free copper has been employed as a solution to this issue. Over Mitsubishi Materials' long history of manufacturing oxygen-free copper, our technicians underwent a trial-and-error process to develop a technology for minimizing and stabilizing the oxygen concentration within copper. With the aid of this technology, we also mass-produce the MSP series, copper alloys containing magnesium, which is challenging to alloy due to its high susceptibility to oxidization. The MSP series exhibits superior strength, bendability, and stress relaxation resistance compared to conventional copper alloys, contributing to the enhanced performance of automotive terminals.

Mitsubishi Materials is also working on increasing the copper recycling rate. As part of this initiative, the Sakai Plant redissolves end materials, including scraps generated at the Sambo Plant and other sites, and promotes their reuse as billets and cakes. These efforts will not only increase the competitiveness of the company but also lead to energy saving and the reduction of CO₂ emissions.



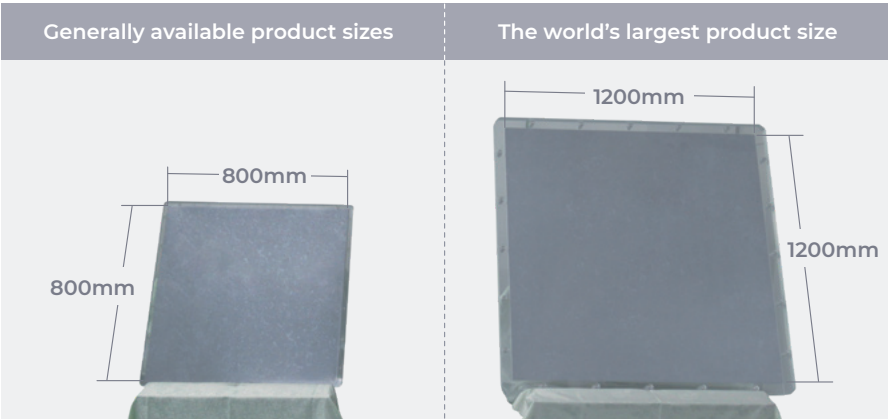
Mitsubishi Materials Electronic Chemicals Co., Ltd.

World-class technical capabilities enable us to manufacture large crystals

With the semiconductor industry developing, the needs for materials for semiconductor manufacturing equipment are increasing. Mitsubishi Materials Electronic Chemicals, one of the Mitsubishi Materials Group companies, manufactures columnar crystal silicon. The silicon is processed into various forms, mainly as a component of semiconductor manufacturing equipment. The company is contributing to the semiconductor industry by supplying the material.

Mitsubishi Materials Electronic Chemicals is planning to increase the production of the columnar crystal silicon, aiming to produce 1.3 times as many ingots as FY2022 by 2026. By this means, the company will meet the increasing demand for materials used in semiconductor manufacturing equipment.

In recent years, there is an increasing need for reducing impurities within semiconductor manufacturing equipment. Currently, the mainstream material for semiconductors is silicon. To avoid containing impurities during the process of producing semiconductors, it is effective to use silicon, which is the common material, in the semiconductor manufacturing equipment. By using high-purity columnar crystal silicon as a component of the manufacturing equipment, the risk of



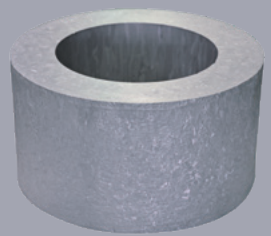
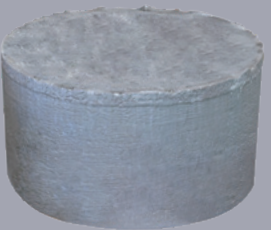
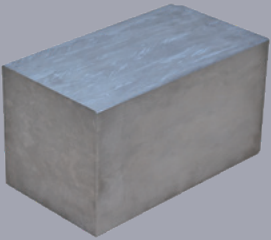
containing impurities can be reduced compared to the case of using other materials, including quartz. This is why columnar crystal silicon is requested for large-sized parts of semiconductor manufacturing equipment, for which other materials were conventionally used. However, large-sized silicon is easy to crack, and its manufacturing and processing requires high technical capabilities. As such, Mitsubishi Materials Electronic Chemicals leverages its manufacturing strengths, which have been established through the high-level precision casting technology cultivated by Mitsubishi Materials. This enables the company to achieve stable production of ingots that are among the

world's largest, measuring 1200 mm in both width and length, to meet the demands of large-sized materials. Mitsubishi Materials Group contributes to the development of the semiconductor industry by utilizing these world-class technical capabilities and establishing a system of expanded production of high value-added products.



Mitsubishi Materials Electronic Chemicals, which plays a pivotal role in manufacturing columnar crystal silicon (Akita Prefecture)

What is columnar crystal silicon?



Ingots processed into various forms

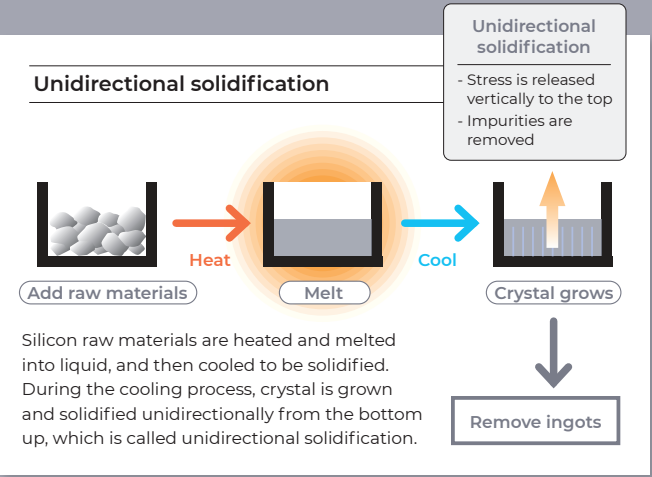
It is silicon with a crystal structure in the form of a column. To create this columnar crystal structure, crystal is grown and solidified unidirectionally, from bottom to top, when casting.

The core technology of developing columnar crystal silicon is this unidirectional solidification. This method grows crystals from the bottom, prevents volume expansion, and releases stress vertically to the top.

The advantage of this method is the prevention of internal cracks during solidification. The unidirectional solidification process enables the release of internal stress that occurs during solidification of the melted silicon.

Another advantage of this method is that impurities move upward and are removed by migration, increasing the purity of the silicon crystalline.

Monocrystalline silicon is mainly used in the current semiconductor manufacturing equipment market, but its physical properties restrict the flexibility of designing equipment compared to the columnar crystal silicon. In addition to providing large-sized parts, columnar crystal silicon is superior to monocrystalline silicon and other polycrystalline silicon in bendability and machinability and can be processed into various forms, including disks, plates, and cylinders, and is thereby highly recognized.



FY2031 Strategy My Challenge



Koji Tsuzukihashi
General Manager
Silicon Parts Development
Department
Silicon Parts Division
Mitsubishi Materials Electronic
Chemicals Co., Ltd.

Aiming to contribute to the development of the semiconductor industry by supplying products in a timely manner

Our Silicon Parts Development Department is engaged in daily work with a focus on improving productivity. The semiconductor-related market we are involved in is changing rapidly, so grasping the market trends, making timely capital investments, and ensuring a supply is essential to surpassing other companies. It is necessary to establish a system for producing columnar crystal silicon so that we can ensure a stable supply in line with market trends and achieve the FY2031 Strategy.

I believe that our columnar crystal silicon is the best in the world in every aspect, including quality, cost, and delivery. Our mission is to foresee a future of semiconductors and establish a system capable of meeting future demands. As a member of Mitsubishi Materials Group, we will further contribute to the development of the semiconductor industry through the production enhancement we have implemented.

FY2031 Strategy My Challenge



Takahiro Sasaki
Person in charge
Silicon Parts Manufacturing
Department
Silicon Parts Division
Mitsubishi Materials Electronic
Chemicals Co., Ltd.

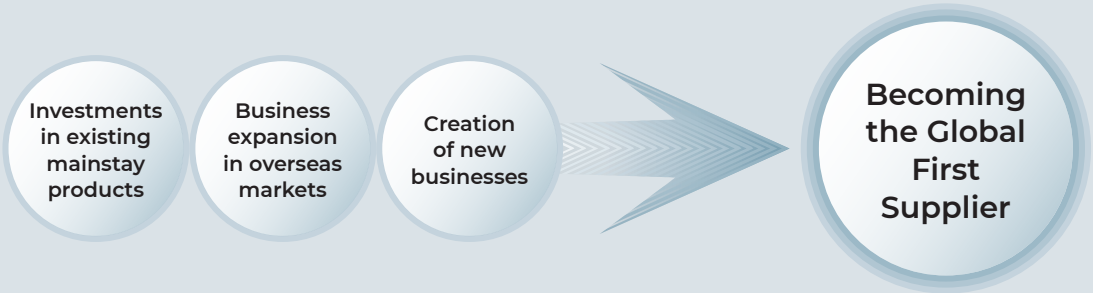
Maintaining product quality to support production expansion systems

I am in charge of leading the casting site. We keep in mind to reduce losses due to human errors and ensure smooth communication at the site and aim to maintain high yields.

In silicon ingot manufacturing, temperature management of the casting furnaces is the key. The management technology for maintaining a certain temperature is required, as silicon is heated and dissolved from a solid condition and then cooled and solidified. In addition, we devise various improvements during the casting process to make silicon easy to remove from the mold. To expand production in the future, we will strive to maintain stable production and quality so that we can contribute to achieving the FY2031 Strategy.

Looking Ahead to the World and Future Growing Markets

To become the Global First Supplier and meet the needs of growing markets more quickly and accurately, Mitsubishi Materials will also work on the business expansion in overseas markets and the creation of new businesses.



Copper & Copper Alloy Business	Electronic Materials and Components Business
Establishing our position as the largest supplier in Japan and expanding sales to overseas customers	Focusing on semiconductor and xEV markets and creating new businesses
We are establishing our position as the number-one wrought copper product manufacturer in Japan, while in overseas markets, we are strengthening our product supply based on our alloy development capabilities and entering growing markets, such as xEV, medical, and environmental fields, with Luvata playing a central role. Additionally, by increasing the recycling rate of wrought copper products, we are contributing to the reduction of GHG emissions and improving cost competitiveness.	In the semiconductor, xEV, and other markets, we provide mainstay products such as processed silicon products/columnar crystal silicon, sealing products, and thermistor sensors, involving our customers at the development stage and adding value to the products. Additionally, we will create new businesses to address new market and customer needs.

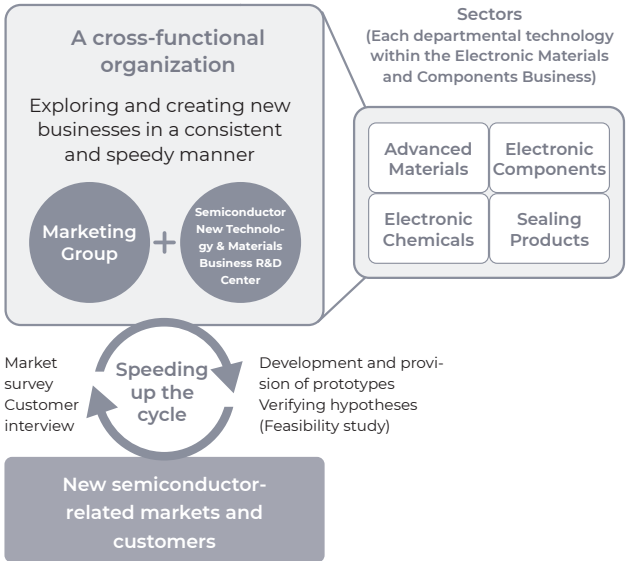
Semiconductor New Technology & Materials Business R&D Center, Electronic Materials and Components Business

Accelerating new business creation through a new organization that consistently manages processes from market needs surveys to development

Every product handled by the Electronic Materials and Components business is unique and niche. In April 2023, we established the Technology Department, a cross-functional organization spanning four departments* composing the Electronic Materials and Components business. Its purpose is to create new businesses by enhancing and combining our niche products. Inside the Technology Department, we established the Marketing Group and the Semiconductor New Technology & Materials Business R&D Center to explore opportunities for new businesses and products, with a particular focus on semiconductor material fields.

The Semiconductor New Technology & Materials Business R&D Center has development and test production functions, creating a consistent system for conducting interviews on market and customer needs and verifying hypotheses through development and test production in collaboration with the Marketing Group. The cross-functional organization will manage the strengths and advantageous technologies of the four departments to create synergies across the entire business.

*Advanced Materials, Electronic Components, Electronic Chemicals, and Sealing Products



Providing the world with people- and eco-friendly lead-free brass with excellent machinability



Jun Oliver Miyazaki

Overseas Strategy Group,
Business Strategy Dept.
Copper & Copper Alloy Business Div.

What is GloBrass®?



GloBrass® is the latest product in our series of lead-free brass with excellent machinability, following ECO BRASS®, which boasts the world's highest sales in the field of lead-free brass with excellent machinability. Featuring its low prices and high performance, the alloy is expected to contribute to the reduction of environmental impact by serving as alternative materials for parts where brass containing lead is used.

Material application proposals

Faucet fittings:
water meters, faucet connectors,
water-saving nozzles, and sprinkler heads

Automotive components:
solenoid valves, bearings for turbochargers,
brake parts, relief valves, temperature
sensors, insert nuts, and tire valves

Electrical components:
two-way valves, three-way valves,
and flare nuts for air conditioners,
and connector terminals

Watches:
crowns and cases

Copper & Copper Alloy Business

Brass is an alloy of copper and zinc used for a variety of applications as an industrial material. In general, around 3.0% of lead is added to brass products to enhance machinability. However, in recent years, regulations regarding lead content have been strengthened, primarily in Europe, with the aim of reducing environmental impact. For example, the RoHS directive and ELV directive prohibit the containing of lead, mercury, cadmium, and hexavalent chromium in electrical, electronic, and automotive components. These regulations are projected to become stricter, and the demand for lead-free brass products with 0.1% or less lead content is increasing.

Under these circumstances, our company developed GloBrass®, next-generation lead-free brass with excellent machinability, in 2020. GloBrass® has approximately twice the conductivity of ECO BRASS®, our conventional prod-

uct. Furthermore, it reduces copper content to cut metal costs while maintaining machinability and high strength, and is expected to be widely used for automotive and electronic components.

As GloBrass® has 0.09% or less lead content, it is anticipated to be widely used for faucet fittings. To accelerate market development in this field, we are proceeding with registering a standard as an alloy that complies with the European drinking water directive.

In the future, we aim to disseminate the product to European and US markets, where environmental regulations are advanced. We collaborate with Luvata, our Group company that has a dedicated license for GloBrass®, strategically work on product development and marketing in the mentioned markets, and strive to establish our position as the Global First Supplier of eco-friendly, lead-free brass products.



Material application proposals





Visiting a Town with MM

Ms. Stride, a woman traveling around the world, visits a town where a Mitsubishi Materials Group hub is located.

MMC Tooling edition



**Navigator
Ms. Stride**
A woman in her late twenties who enjoys factory tours and strolls around town.

In this edition, we will introduce two towns in which MMC Tooling, a company involved in the cutting tools and related businesses, is located.

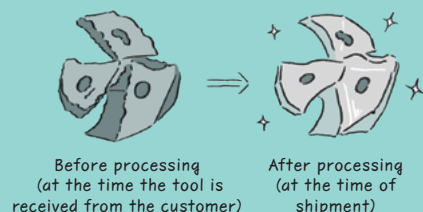
MMC Tooling's Main Plant is located in Akashi City, Hyogo, and their Kyoto Plant is in Ujitawara Town, Kyoto. With "Super first-class manufacturing through participation by all" as their management policy, MMC Tooling is contributing to parts manufacturing with sophisticated technology.



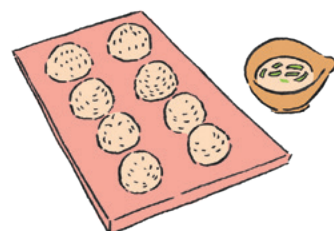
Responsible for resharpening tools!

About the Main Plant

At the Main Plant, cemented carbide drills and end mills used by customers are resharpened, bringing their performance up to the same level as that of new products. The shapes and conditions of the tools' blades differ depending on how the customers use them, so MMC Tooling is required to have advanced processing technology to flexibly handle any situation.



Before processing
(at the time the tool is received from the customer)
After processing
(at the time of shipment)



Akashiyaki

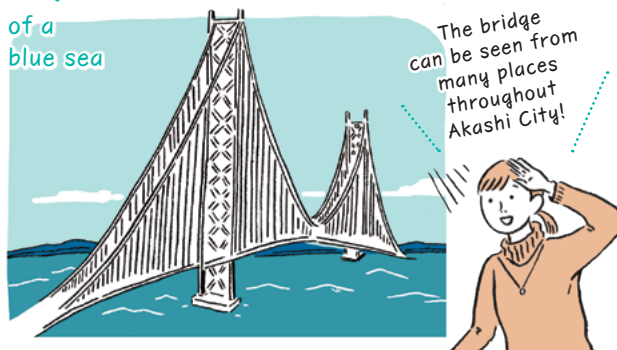
A specialty dish tasting of fluffy eggs

Akashi is famous for octopus. Akashiyaki is a local food in which octopus, the local specialty, is wrapped in an egg-rich batter. It is eaten while still very hot and after being dipped in dashi, a Japanese soup stock.

Akashi Kaikyo Bridge

A spectacular view of a grand bridge and a blue sea

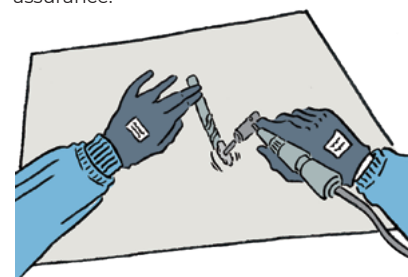
A bridge crossing the Akashi Strait, connecting Honshu to Awaji Island. It's one of the world's longest bridges, measuring a total 3,911 m in length. Visitors can enjoy seeing it lit up at night.



The bridge can be seen from many places throughout Akashi City!

Improving performance with detailed handwork

Detailed processing is not done with machines, but each and every cut is made by hand. Measuring with a machine after making fine adjustments with a slight force is linked to quality assurance.



Tool inspection

We inspect the tools received from customers before resharpening them. After confirming the condition of the blades, we begin surface treatment and sharpening.



Guide

Serika Watanabe

Administration Dept.
Joined the company in 2017. Mainly in charge of accounting. She recommends seeing the illumination at Akashi Castle in Akashi Park. Her favorite local food is the parfait at GF Kitchen, a café in Akashi City. In her spare time, she also hosts cosplay events at Akashi Park!



The birthplace of Japanese green tea

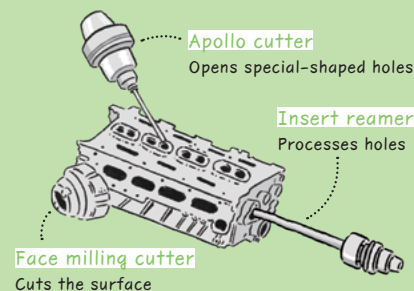
Relaxing tea farms stretching far

Ujitawara Town is often referred to as the birthplace of Japanese green tea since Nagatani Soen, a local tea farmer, invented and popularized the method of producing green tea leaves for *sencha*. With numerous tea farms, the town has become a central hub for tea production in Kyoto.

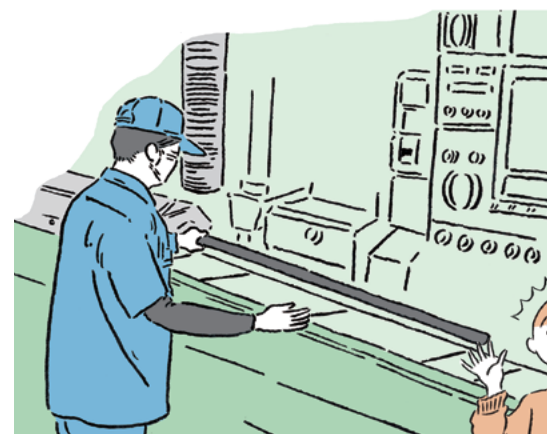
Manufacturing special tools!

About the Kyoto Plant

At the Kyoto Plant, special tools are manufactured to meet the numerous orders of customers. The plant produces a wide range of tools in small amounts, making them perfect examples of custom-made products. In contrast to mass-production plants, more sophisticated technology is required. The Kyoto Plant mainly manufactures tools for cutting automotive engines.



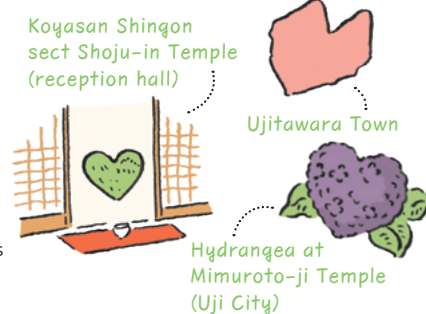
Handmade with highly accurate skills



The town of hearts

A heart at a temple And even the town's shape is a heart!

Looking at a map, Ujitawara Town is in the shape of a heart. It has recently gained attention as a town of hearts, and the local Shoji-in Temple is popular for its heart-shaped window. In Uji City, located next to Ujitawara Town, visitors can see famous heart-shaped hydrangeas at Mimuroto-ji Temple.



Byodo-in Temple

A familiar, magnificent world heritage site on the 10-yen coin

Located near Uji Station, the closest station to the Kyoto Plant, is Byodo-in Temple, opened by Fujiwara no Yorimichi in 1052. It is said the temple was built to represent the paradise of the Pure Land. Houou-do (Phoenix Hall) is especially famous for the its depiction on the 10-yen coin. Visitors can also enjoy the nature and flowers during each of the four seasons.

Programming with CAM

In order to process complicated shapes, CAD data is used to create an NC program (a processing program used to operate machining centers, a type of machining equipment). By doing this and smoothly passing the baton on to the machining center operator, a short delivery time can be realized.



Guide

Kuniko Kono

Administration Dept.
Joined the company in 2011. Mainly in charge of general affairs, accounting, public relations, occupational health, and more. Her local recommendations are Mimuroto-ji Temple and Uji City Botanical Park, famous for their flowers. She likes to visit temples in Kyoto. Her favorite place is Uji Kochakan.



This is what I call craftsmanship! The longer the tool, the more advanced technology is required!



“Supporting the future of manufacturing with the power of procurement”

Kanchu Oh
Purchasing Office
Procurement & Logistics Dept.,
Professional CoE

A sense of balance is key in procurement work, which supports the foundation of business activities

Mitsubishi Materials delivers world-class materials and products created at its plants, smelters & refineries, and Group companies across the nation to society. We can work for people, society, and the Earth. I became interested in the scale of this work and decided to join the company to build my career here.

I am in charge of procurement work in the Procurement & Logistics Department. This job involves the purchasing of items necessary for business activities and supports the foundation of the company from behind the scenes. Currently, I procure energy and industrial gas for use at Mitsubishi Materials and Group companies from around the world and deliver them to manufacturing sites.

In this job, having a sense of balance is of the utmost importance. Our mission is to balance QCD (quality, cost, and delivery) to provide high-quality products at a low cost and in a timely manner.

We must work closely together with and grasp the needs of departments within the Group who need materials procured, while building solid relationships with suppliers as we ensure procurement with balanced QCD. It is challenging, but I feel satisfied when I am able to fulfill people's requests and

makes them happy through my work.

Making cooperation across organizational boundaries our strength

Failing to get our hands on just one small part can stop production. I became keenly aware of the weight of the responsibility of procurement work when I was assigned to the Kyushu Plant* immediately after joining the company. A stable and mistake-free procurement of a wide range of parts and facilities is required for one plant to continue production. Getting to see this site up close formed the foundation of my corporate life.

In the energy and industrial gas procurement work of which I am currently in charge, interdepartmental coordination that crosses organizational boundaries has grown stronger, and the style of procurement has evolved.

For example, when contemplating the use of new energy and industrial gas at a business, the procurement division also considers specifications and other factors together from the planning stage, enhancing coordination to conduct procurement using optimal methods. I feel this is thanks to the efforts of our seniors, which grew the presence of the Procurement & Logistics Department itself.

Additionally, each Company currently has their own procurement depart-

ment in order to realize more attentive and speedy operations. Everyone in each Company's procurement department has established a framework for cooperation in which they quickly gather information on their Company's new projects and share it with us, who are involved in the procurement of the entire company and Group. This further supports our procurement work.

I want to fulfill my duties in realizing carbon neutrality

Mitsubishi Materials is committed to implementing GHG (greenhouse gas) emissions reduction measures as part of the Medium-term Management Strategy FY2031, toward our goal of realizing carbon neutrality by 2045. I also want to contribute to achieving this goal through the energy-related work in which I am currently involved.

For example, fuel conversion is one of these initiatives. More specifically, we are planning to replace the fuel currently used at some locations with a different fuel that emits less carbon dioxide. I hope to expand these initiatives horizontally throughout the company.

Going forward, I will continue to carry on my work as a specialist in procurement and logistics at Mitsubishi Materials. I want to achieve work that accurately meets the needs of the new era, such as carbon neutrality, while I fulfill my own duties.

Mr. Oh values the mutual support and teamwork with his coworkers in the Procurement and Logistics Department. According to him, the department is full of diligent and hard-working people. He said that his workplace is comfortable and easy to work in as it embraces diverse people of various nationalities.



*In April 2022, the Kyushu Plant came under direct control of our equity method affiliate, Mitsubishi UBE Cement Corporation.



The Power of Materials Builds Society

Agriculture

Sulfuric acid, an ingredient used in fertilizers to support the supply of agricultural products

In recent years, global population growth has led to an increased demand for food, which in turn has increased the need for fertilizers. Among the essential ingredients used in fertilizers is sulfuric acid. Despite its reputation as a hazardous chemical, sulfuric acid is actually an important ingredient that helps plants grow. It is indispensable for ensuring a stable food supply.

Mitsubishi Materials supports the stable supply of fertilizers by producing and supplying sulfuric acid. It all began in the 1930s when we started producing sulfuric acid as a byproduct while detoxifying emissions from copper smelting.

Currently, one of the primary methods of producing sulfuric acid is sulfur roasting, which uses petroleum-derived sulfur. However, due to the growing emphasis on decarbonization, there is a possibility that the production and supply of sulfuric acid through sulfur roasting may decrease in the future. To make up for this shortage, we anticipate a surge in demand for sulfuric acid derived from copper smelting. Moving forward, Mitsubishi Materials will continue contributing to the development of agriculture through the production and supply of sulfuric acid that can meet market needs.

PICK UP

Concentrated Sulfuric Acid

Generally, sulfuric acid with a concentration of 90–100% is referred to as concentrated sulfuric acid. Mitsubishi Materials produces concentrated sulfuric acid with a concentration of 98% by recovering SO₂ gas generated from copper smelting plants. It is used in various applications, including fertilizers, inorganic chemicals, and textiles.

The Secrets of Materials



Exploring the “secrets” of materials and technologies Mitsubishi Materials has developed!

SOZAI FILE NO.7

What type of material is

“CLEANBRIGHT®”?

Mitsubishi Materials’ alloy development technology is utilized in many objects we interact with on a daily basis. One such example is the copper alloy CLEANBRIGHT®, which leverages the antibacterial and antiviral properties of copper. It is used for hospital door handles, handrails, and more. Furthermore, this new copper alloy maintains its beautiful champagne gold color for a long period of time.



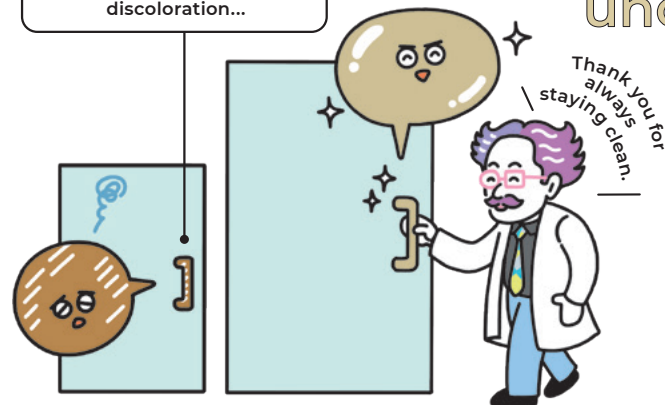
an expert on materials
Dr. Materials

A doctor who loves materials devoted to research at a Mitsubishi Materials lab.

Antibacterial and antiviral! A copper alloy that’s perfect for hygiene measures!

CLEANBRIGHT® is a copper alloy with long-lasting antibacterial and antiviral effects. These effects are attributed to copper’s ability to rapidly destroy bacteria and viruses. Additionally, CLEANBRIGHT®, with its ease of processing, is well-suited for manufacturing items like door handles and handrails that are frequently touched in our daily lives, making it a valuable choice for scenarios where antibacterial properties are desired.

With conventional copper alloys, the oxygen in the air and the moisture on people’s hands can cause discoloration...



The sophisticated and beautiful color remains unchanged for a long time!

The unique feature of CLEANBRIGHT® is that it has better resistance to discoloration compared to conventional copper alloys. Copper tends to discolor due to factors like the oxygen in the air and the moisture on people’s hands. However, Mitsubishi Materials has solved this issue using its know-how and advanced evaluation techniques cultivated through years of alloy development. We have successfully developed an alloy that is less prone to color irregularities caused by discoloration. Even after long-term use, such as 5 or 10 years, there is no noticeable change. The original sophisticated and beautiful color and shine of champagne gold will remain for a long time!

With the increased awareness of hygiene due to the COVID-19 pandemic, it is gaining even more attention.



Areas of applications



For infection control in medical facilities

The antibacterial and antiviral properties of CLEANBRIGHT® make it ideal for infection control in medical facilities. It is used for various objects in hospitals, such as door handles, handrails, trays, and plates. Its applications have also expanded to everyday items, such as pens and tea canisters, drawing further attention.

TOPICS

Here are some of the main topics involving Mitsubishi Materials from July to September 2023.

\ Please take part in the WITH MATERIALS survey /

We would love to hear your honest thoughts and opinions about this issue of “WITH MATERIALS” and what you would like to see covered in the future.

<https://forms.office.com/r/GJpgym04ZV>



July | Mitsubishi Materials Group Community Contribution Activity Policy Established

Mitsubishi Materials Group has established a fundamental policy regarding our contribution activities to local communities with the aim of more actively and positively promoting these activities. The three focus areas are “Promotion of local environmental protection and conservation activities,” “Supporting next-generation education and Diversity and Inclusion,” and “Coexistence with local communities,” and through these activities, we will strive to ensure the sustainable growth of our business. We will formulate and implement specific action plans by engaging in dialogues with local communities and partner organizations to better understand social needs and challenges. Furthermore, the Group will continue its communication activities with local communities at each of our locations, contributing to the realization of a sustainable society.



July | Elementary School Students Experience Forestry Work at Our Company-owned Forest in Hokkaido

We use our company-owned forest near Atsuma Town in Hokkaido to offer practical classes for elementary school students, allowing them to experience forestry work, which is the primary industry of the town. This year-long program teaches students a wide range of processes, from planting trees to processing wood, through collaboration between our company and forestry organizations. In a class on July 11, elementary school students used sickles to remove weeds and scrub. These classes serve as opportunities for children to take an interest in their local forests, and we plan to hold practical classes on thinning and other topics in the fall and beyond.



July | Created Key Visual of Our Commitment

We created a key visual to visually express Our Commitment, “For people, society and the earth, circulating resources for a sustainable future,” set forth in our Medium-term Management Strategy FY2031, which covers the period from FY2024 to FY2031. The circular design represents the uninterrupted and powerful circulation of metal resources and their growth while adding further value. The texture evokes metal, expressing Mitsubishi Materials’ unique approach to resource circulation. In addition, on the occasion of the creation of our key visual, we published a webpage for Our Commitment on our corporate website. Going forward, we will introduce various initiatives toward the realization of Our Commitment.



Our Commitment



July/August | Issued Integrated Report 2023 and Sustainability Report 2023

At the end of July, we issued Integrated Report 2023. This report is designed to disclose not only financial aspects but also non-financial aspects, with the aim of helping our stakeholders understand our medium- to long-term growth potential. It also introduces the Medium-term Management Strategy FY2031 as well as various initiatives to achieve Our Commitment. Additionally, we issued Sustainability Report 2023 at the end of August. This report is published to provide stakeholders with a better understanding of the Group’s approaches and initiatives regarding sustainable management, as well as their outcomes, challenges, and future directions. Both reports are available on our corporate website.

Integrated Report 2023



Sustainability Report 2023



August | Family Day Held at Our Head Office

On August 2, 3, and 8, we hosted Family Day as a summer office event. For this event, we invited the families of our employees working at the Marunouchi Head Office to express our gratitude for their daily support to our employees. It also served as an opportunity to deepen their understanding of our company and business and help them feel closer to the company. In addition to an office tour, we held a sticker rally (a game where participants answer quizzes and collect stickers to win prizes) and other events for the children. After an explanation about Our Commitment, participants were asked to choose one vision for their desired society—either a “prosperous society,” a “recycling-oriented society,” or a “decarbonized society”—and write supportive messages to our Group and employees. Participants expressed their satisfaction with feedback such as “This event was fun for the children and allowed us to learn more about Mitsubishi Materials’ business,” highlighting the value of this event as an opportunity for employees, their family members, and our company to interact.



September | Support for “Business for Marriage Equality”

We have expressed our support for “Business for Marriage Equality (BME),” which promotes marriage equality (legislation of same-sex marriage) in Japan. BME is a campaign jointly run by three groups, the Public Interest Association of Marriage For All Japan, the NPO Lawyers for LGBT & Allies Network, and the certified NPO Nijiro Diversity. Based on the notion that people are the creators of new value and the source of sustainable growth for our Group, we aim to achieve maximum organizational performance by creating an environment in which members of a diverse range of characteristics can coexist and recognize one another, allowing each individual to actively demonstrate their own abilities.





Planting a chestnut tree at a tree-planting ceremony (Mori Town, Hokkaido)

Striving for forests cherished by the community and valued by society

Forests are special places where people can connect with nature and relax.

The Materials' Forests owned by Mitsubishi Materials are one such place. However, in 2016, a Materials' Forest and the nearby forest in Mori Town, Hokkaido, suffered extensive windfall damage due to a powerful typhoon. What could we do for the community, and by extension, for society? With this question in mind, Mitsubishi Materials, in collaboration with local residents, has been working on the restoration of these damaged forests.

As part of this effort, we have been organizing tree-planting festivals since 2018. This year marks our fourth ceremony, and we planted 250 chestnut trees alongside around 40 local residents. With the intention of allowing children to interact with the forest and the abundant nature they don't often get to experience, we also organized activities such as a picture-story show and a log-cutting experience.

The smiles on the faces of children as they touched the plants and soil, their whole-hearted engagement in the activities, and the warm gazes of their parents watching over them – witnessing all of these up close brought us an incomparable joy. Moving forward, we will continue striving for forests cherished by the community and valued by society and work with local residents to create flourishing forests.