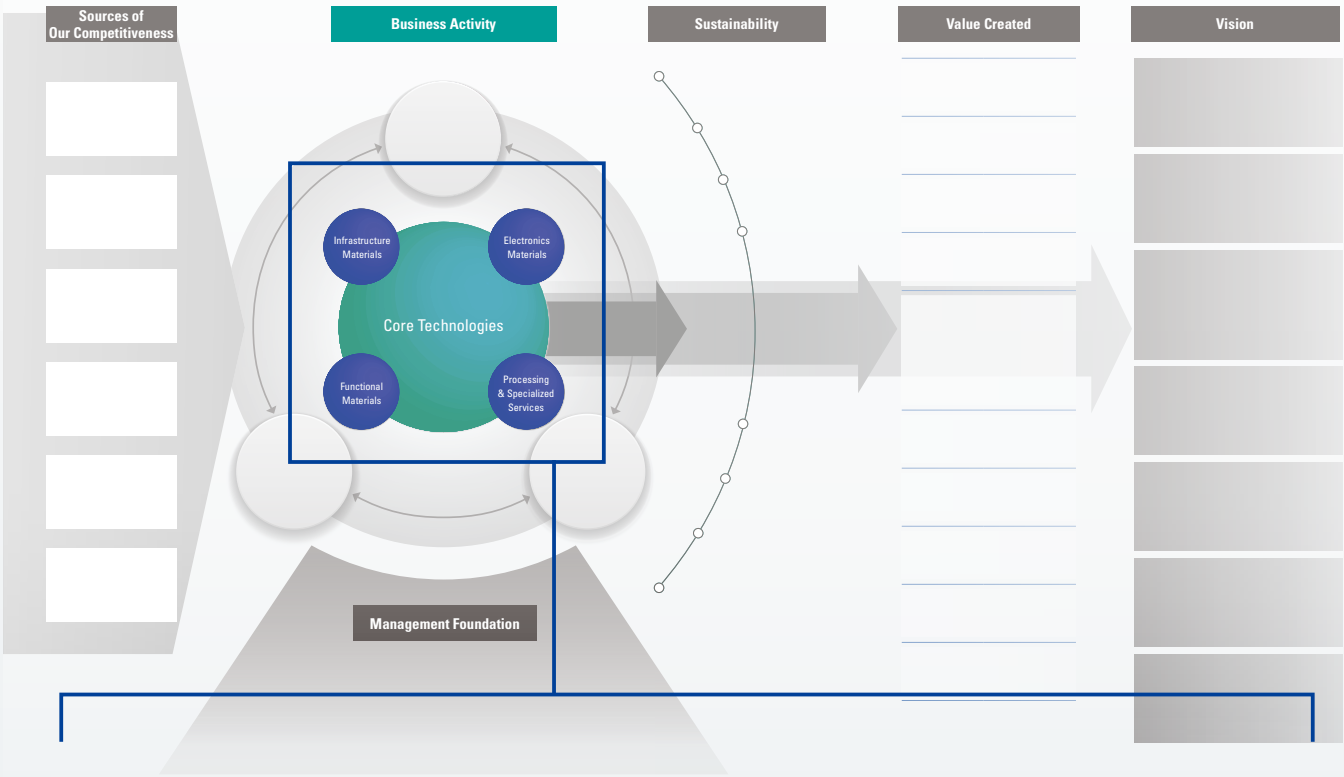
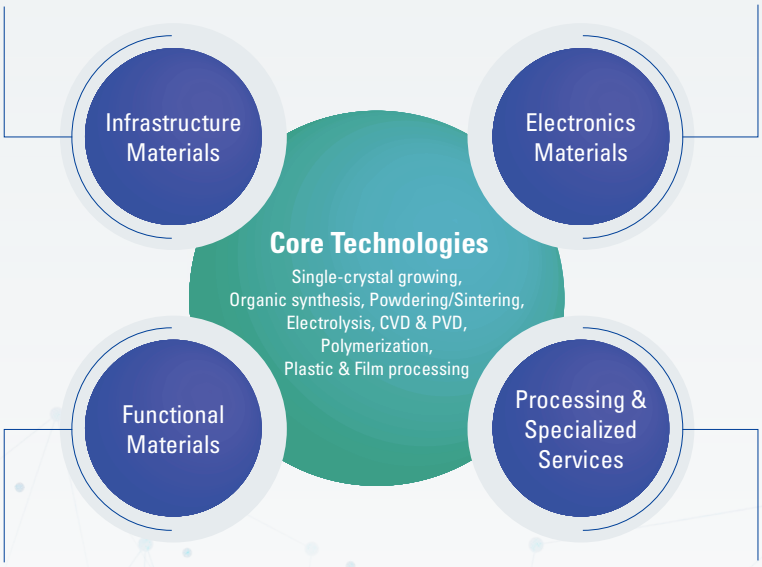
Leveraging our core technologies in four business fields to manufacture materials and products that underpin industries and livelihoods



PVC is indispensable to our lives mainly in the areas of infrastructure, housing, and agriculture. As the largest manufacturer of PVC, we provide a stable supply to customers around the world.

In addition to our world-leading share in silicon wafers, we provide various materials that are essential for semiconductor manufacturing. We contribute to the digital transformation and green transformation of industry.



Along with more than 5,000 different types of silicones that support people's lives and industries, we provide a stable supply of high value-added products. We also help alleviate environmental impacts and food shortages.

Meeting the diverse needs of customers by leveraging the advanced technological capabilities developed by the Shin-Etsu Group.

Technologies, Materials and Products of the Shin-Etsu Group

The Shin-Etsu Group makes a wide array of products for use in a broad range of industrial fields by drawing on the production technologies accumulated in the process of continuously diversifying and improving its product offerings. By reciprocally maintaining close relationships, our business mix extends across many different fields and we have built a robust business structure impervious to economic conditions.

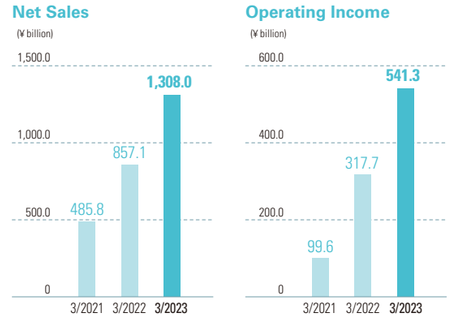
*1 Chemical vapor deposition (CVD)
A method for depositing thin film by chemical reaction on the substrate of precursors produced by applying energy such as heat, plasma, or light to raw material gases.

*2 Physical vapor deposition (PVD)
A method for adhering and depositing on the substrate surface by evaporating and scattering solid raw materials as atomic/molecular particles by heating, sputtering, ion beam irradiation, etc.

Business Overview

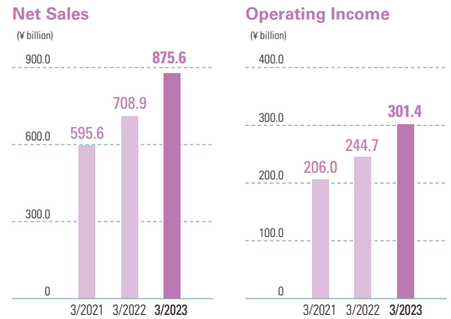
Infrastructure Materials

As for PVC, the signs of a global economic recession appeared in the market but bottomed out at the end of 2022. On the other hand, the caustic soda market remained firm but began to weaken after the turn of the year. Under these circumstances, we worked to achieve full production and full sales based on precise demand forecasts in the global market and to conduct detailed price negotiations reflecting market fluctuations.



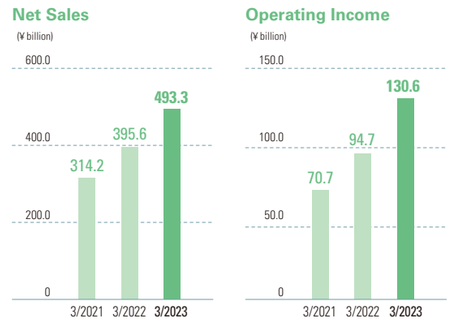
Electronics Materials

The semiconductor market had entered an adjustment phase since the autumn of last year, and a similar situation remained at the end of the year, but the semiconductor materials as a whole were supported by the performance in the first half of the year. Rare earth magnets were also affected by the semiconductor shortages in customer production and the adjustments in data center investment, but the shipments to other markets made up for it.



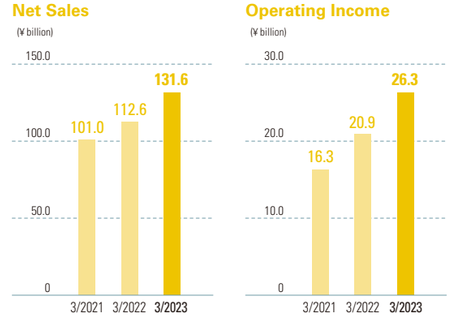
Functional Materials

In silicone products, although some product lines were affected by inventory adjustments and declining market prices in the second half of the fiscal year, we worked to maintain profitability by increasing the proportion of high-performance products such as automotive, personal care etc., and by promoting the development and launch of products with reduced environmental impact. Shipments of cellulose products, particularly high-value-added pharmaceuticals, were firm.



Processing & Specialized Services

The sales of semiconductor wafer-related containers were strong mainly for 300mm wafer use, and the sales of input devices for automobiles increased. The sales of PVC-related products such as PVC wrapping films for food packaging and construction materials increased due to the permeation of revised prices.



Infrastructure Materials

PVC is indispensable to our lives mainly in the areas of infrastructure, housing, and agriculture. As the largest manufacturer of PVC, we provide a stable supply to customers around the world.

Using Our Products to Solve Societal Issues (PVC)

Protecting the planet by reducing greenhouse gas emissions and expanding social infrastructure to cope with population growth

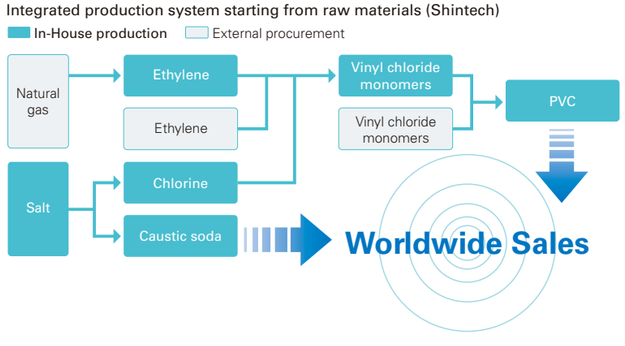
- Salt accounts for roughly 60% of the raw materials used to make PVC and is a commodity that still exists in abundance throughout the world. As the production of PVC does not rely heavily on petroleum resources, it makes effective use of the planet's limited resources. As such, CO_2 emissions during the PVC production process are lower than other plastics.
- The main applications of PVC are pipes and construction materials. Products made with PVC help conserve resources because they have a longer service life compared to other plastic products (PVC pipes last around 50 years*).
- PVC-framed windows boast superior thermal insulation and therefore help lower energy consumption and curb CO_2 emissions.
- PVC construction materials are much lighter than materials made from steel, for example, which leads to reductions in the amount of fuel required to transport them and move them into place during construction.
- In Japan, the material recycling rate for PVC is about 33%*, higher than that for other types of plastic.

*Source: Ministry of Land, Infrastructure, Transport and Tourism, Vinyl Environmental Council

Competitive Advantages (PVC)

- Efficient production with the world's largest production capacity
- Stable quality and stable supply to customers
- Favorable raw material situation and stable energy procurement in the U.S.
- Integrated production system starting from raw materials (ethylene)
- Three global bases, and production at multiple sites in three locations in the U.S.
- Global sales network

Integrated production system starting from raw materials (Shintech)



Major Products and Applications

PVC

PVC is extremely durable and easy to work with. It can also be easily recycled. For these reasons, it is used widely in items related to our daily existence. For example, PVC pipes in water supply and sewerage systems help extend the useful life of such infrastructure because they do not need to be replaced for at least 50 years.

PVC Pipes

PVC-Framed Windows

Plastic Greenhouses for Agriculture

Caustic Soda

Caustic soda is a base chemical produced from the electrolysis of salt and is indispensable to various industries for the purpose of alumina extraction, as a raw material in lithium-ion batteries and super-absorbent polymers, and for water treatment.

Alumina

Cathode Materials for Lithium-Ion Batteries

Polyvinyl Alcohol (POVAL)

Polyvinyl alcohol (POVAL) has many applications, including adhesives, various types of film, textile treating agents, interlayers of laminated glass, and pharmaceutical additives.

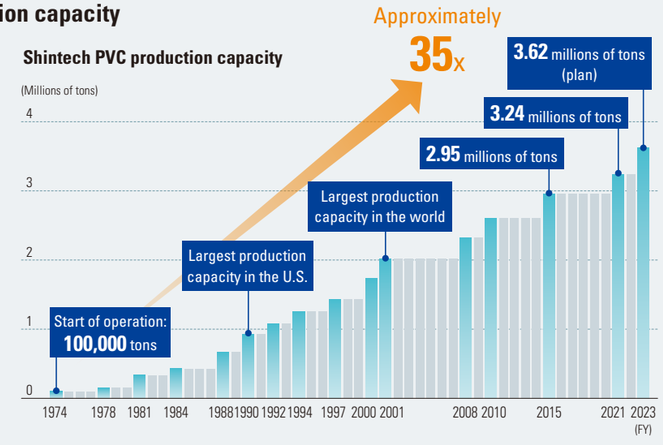
Car Windshields

Topic

Shintech: Augmenting PVC production capacity

Shintech, one of the Group's subsidiaries in the U.S. and the world's largest manufacturer of PVC, boosted its annual production capacity to 3.24 million tons by bringing online a new plant with an annual production capacity of 290,000 tons at the end of 2021 to meet brisk demand in mainly North America and emerging countries. Construction is underway on a PVC plant expansion that will have an annual production capacity of 380,000 tons after completion, thereby increasing Shintech's total production capacity to 3.62 million tons. In order to stably supply PVC to customers worldwide, in 2020 the company established an integrated production system starting from raw materials, chiefly by producing in-house some of the ethylene required for PVC manufacturing.

Shintech PVC production capacity



Electronics Materials

In addition to our world-leading share in silicon wafers, we provide various materials that are essential for semiconductor manufacturing. We contribute to the digital transformation and green transformation of industry.

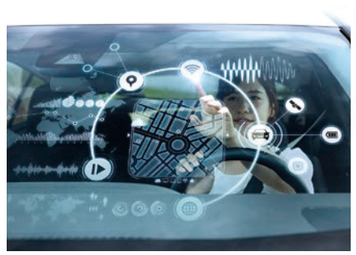
Using Our Products to Solve Societal Issues

Development of AI, 5G, automated driving, IoT

To achieve fully automated driving and telemedicine, 5G-compatible communication devices and infrastructure are necessary, and many high-performance, energy-efficient semiconductors are used in these devices. Silicon wafers, the substrate material for semiconductors, and various other semiconductor materials provided by the Shin-Etsu Group not only help to enhance performance and reduce the size and weight of electronic devices, but also contribute to improving electric power conservation and efficiency, thereby supporting the expansion and continuous growth of semiconductors on multiple fronts.

Providing technologies and materials essential for carbon neutrality

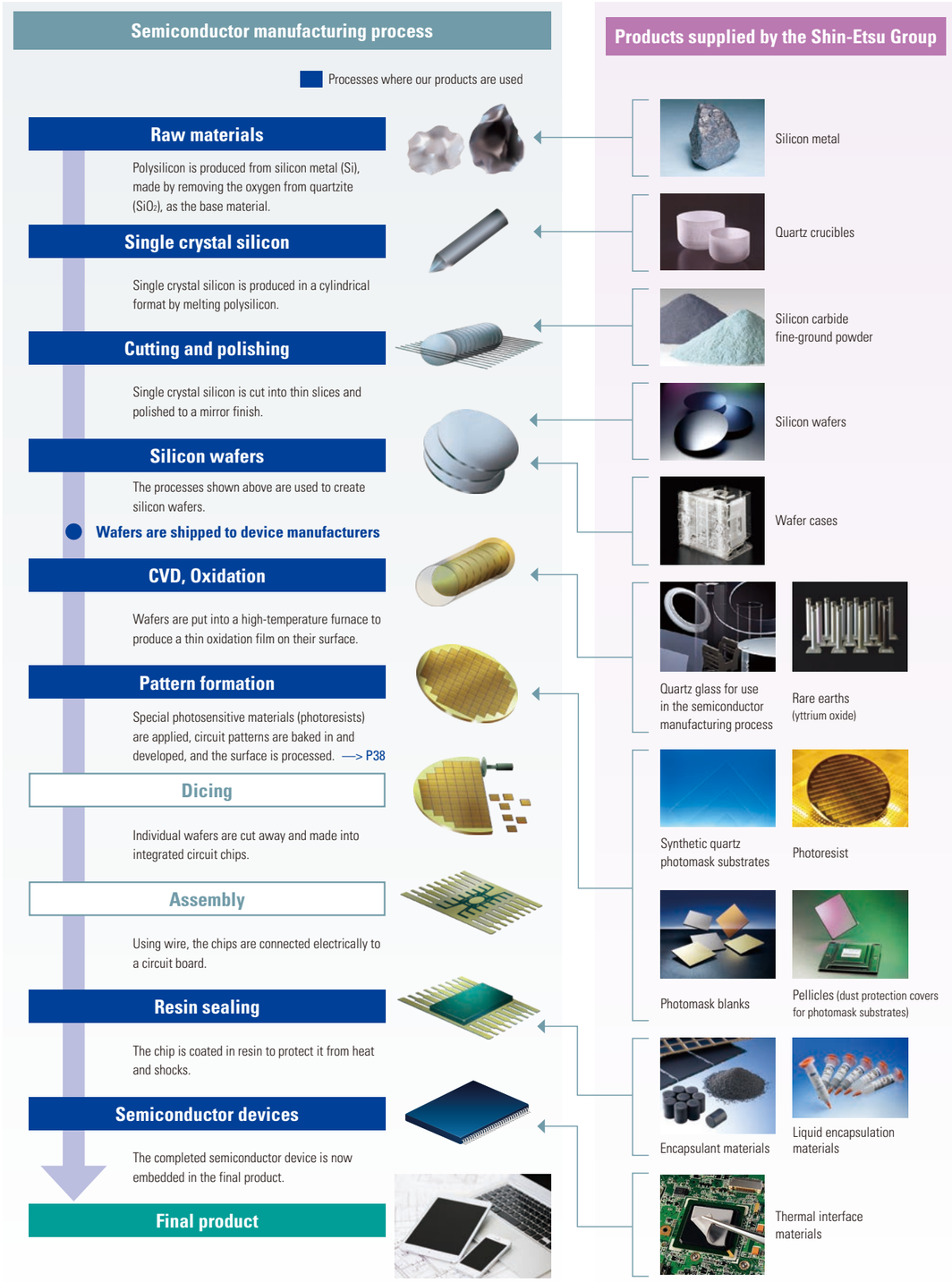
Rare earth magnets, which have about 10 times more magnetic force than conventional ferrite magnets, help enhance motor efficiency and power consumption, contributing to improved energy efficiency and reduced greenhouse gas emissions.



Competitive Advantages

Overall business	• Stable quality and stable supply to customers • Responding to increasingly sophisticated technological requirements
Semiconductor-related products	• Synergies gained from an extensive lineup of semiconductor-related products (competitive edge in development and proposal capabilities)
Rare earth magnets	• Stable supply supported by operating multiple production bases and an established integrated production system starting from raw materials • Development of products that substantially reduce the use of heavy rare earth materials and promotion of recycling

Shin-Etsu Group Products Associated with the Overall Semiconductor Manufacturing Process

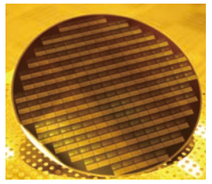


Major Products and Applications

Silicon Wafers

Silicon wafers are the substrate material for semiconductors and are used in all kinds of devices, from smartphones, home appliances, automobiles and other devices that we see in our daily lives, to cutting-edge fields such as AI and IoT. Shin-Etsu Group's silicon wafers, including our quality control and evaluation analysis, have earned high praise from customers around the world, along with our high-precision single crystal technologies, high-end processing technologies, and high-quality epitaxial growth technologies for advanced logic and imaging devices.

Photoresists

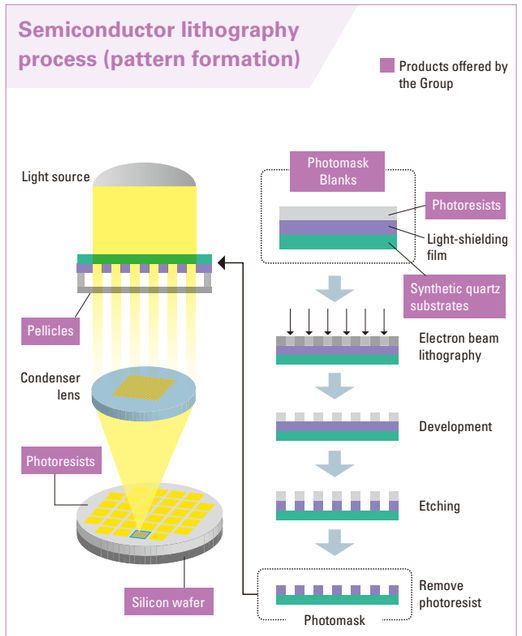


A circuit pattern is formed by applying photoresists to the surface of a silicon wafer and then passing light through a photomask to expose the surface in that pattern. In addition to photoresists for excimer lasers (KrF, ArF) and EUV, we also supply spin-on middle/under-layer hardmasks used in the nanofabrication process.

Photomask Blanks

Photomask blanks are the material that forms a thin metallic film on the surface of a synthetic quartz substrate and serve as patterning templates when drawing circuits on silicon wafers. In addition to providing photomask blanks for use with krypton fluoride (KrF) and argon fluoride (ArF) lasers, we have established state-of-the-art photomask blank mass production technologies, including multilayer film structures and permeable membrane structures with excellent light resistance properties.

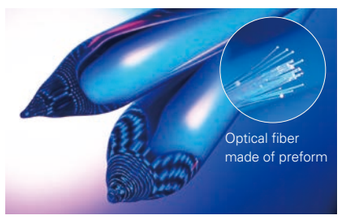
Semiconductor lithography process (pattern formation)



Synthetic Quartz

Synthetic quartz, the key material of optical fiber, provides superior light transmission. In an ordinary glass plate, light attenuates in about two meters. However, synthetic quartz allows light to reach a distance of about 100 km. The Group was the first in the world to mass produce synthetic quartz, which is higher in purity than natural quartz. Due to these attributes, it is used as an optical fiber, a photomask substrate for semiconductor lithography and a stepper lens for semiconductor lithography. In addition, it is used as a large-scale photomask substrate for flat panel display (FPD) lithography, including liquid crystal and OLED displays.

Large-size photomask substrate for FPD



Preform for optical fiber

Rare Earth Magnets

Rare earth magnets are used in products such as automobile motors, power generators, industrial robots, compressor motors for air conditioners, motors for hard disk drives utilized in data centers and other facilities and wind power generator motors. We are engaged in the manufacture of these magnets from the separation and refinement of rare earths as raw materials to the magnet product. Furthermore, it is reliably supplying high-quality rare earth magnets with advanced features by means of the development of its own grain boundary diffusion method, which reduces the amount of heavy rare earth used, while maintaining high performance.

Electric vehicle

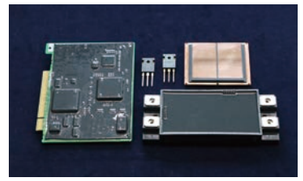
Data center

Rare Earths

Known as the "vitamins of the high-tech industry," rare earth elements are used in a variety of applications depending on their individual characteristics. They are used in the light-emitting devices installed in diagnostic imaging systems such as CT scanners and contribute to improved testing safety at medical sites.

Encapsulant Materials for Semiconductor Devices

These materials are notable for their superior heat and crack resistance and are used in general semiconductors, automotive power modules and devices for home appliances. Furthermore, the encapsulant materials we have developed for large-scale packaging improve the rate at which materials are effectively utilized, contributing to the reduction of device manufacturing costs.



LED Packaging Materials

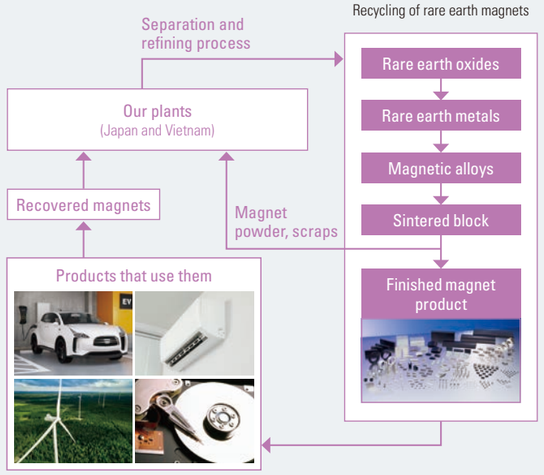
These materials offer high transparency, heat resistance, and other excellent properties, and help prevent the degradation of LED brightness over a long period of time.

Topic

Strengthening the supply chain for rare earth magnets in anticipation of further increase in demand

The goal of a carbon-neutral society has created strong demand for rare earth magnets, and further growth in the global market for rare earth magnets is expected due to the spread of electric vehicles, the increase in renewable energy such as wind power generation, and the growing demand for energy-saving home appliances and industrial equipment associated with factory automation. We are strengthening our supply chain to meet this demand.

In recent years, it has also become increasingly important from the perspective of economic security to secure a stable supply of rare earths as raw materials. The Shin-Etsu Group has technologies for separating and refining rare earths, and in addition to recycling magnet powder from the processing of rare earth magnets, we are also working to utilize rare earth magnets recovered from end-of-life products, also known as "urban mining."



Functional Materials

Along with more than 5,000 different types of silicones that support people's lives and industries, we provide a stable supply of high value-added products. We also help alleviate environmental impacts and food shortages.

Using Our Products to Solve Societal Issues

Low environmental impact of silicone

Silicone primarily consists of silicon (Si), which is the second-most abundant element found in the outer layer of the earth's crust, behind oxygen. As a raw material, it is associated with a low dependence on petroleum resources and a low environmental footprint. Silicones' outstanding properties are used in environmentally friendly products such as electric vehicles, fuel-efficient tires, solar power generation, and LED lighting.

Addressing food shortages and environmental issues (cellulose derivatives)

Cellulose derivatives are an environmentally friendly material made from natural polymer cellulose. They help address the food shortage and environmental problems caused by population growth, with one of their uses being a binding agent for plant-based meat substitutes.

Improving food safety (synthetic pheromones)

Synthetic pheromones are an environmentally friendly agricultural pest control agent that has no impact on beneficial insects or other organisms, and helps improve food safety by reducing the amount of insecticides and pesticides sprayed on fields.

Competitive Advantages

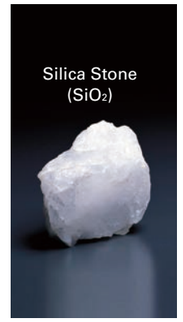
Overall business	• Ability to develop a variety of high value-added products by leveraging our technological capabilities • High quality products and stable supply system
Silicones	• Thorough response to customer needs through the triangular link of sales, research, and production divisions • Use of advanced technological capabilities and know-how cultivated over 70 years • Global production bases and a sales network in 13 countries • Continuous expansion of production capacity
Cellulose derivatives	• Stable supply system supported by three global bases

Major Products and Applications

Silicones

Silicone is a man-made compound created from silica stone, which is abundantly available on our planet. It is a highly functional material with unlimited possibilities, as it features both inorganic and organic properties and has numerous excellent characteristics, as well as a high degree of freedom in product design. Silicone is used in a wide range of fields, including electricals and electronics, automobiles, construction, cosmetics, healthcare, and foods.

Core raw material used in silicone



Silicone representative configurations

Major characteristics of silicone

- Heat resistance
- Cold resistance
- Adhesion properties
- Defoaming properties
- Electrical insulation properties
- Water repellency
- Release properties
- Weather resistance

Cosmetics

Electric Vehicles

Contact Lenses

Buildings

Plastic Products

Textile Treatments

Cellulose Derivatives

This is made from pulp, a natural material derived from wood and cotton linter. In the pharmaceutical field, it is used, for example, as a coating agent for pills to control where drugs dissolve in the body and to make them dissolve gradually. In industrial applications, cellulose derivatives are used as a molding aid for automotive exhaust gas filters, contributing to the prevention of air pollution, and in the food industry, it is used as an additive to thicken, gelatinize, stabilize foam, and prevent deformation during cooking.

Pharmaceutical

Industrial

Food

Silicon Metal

Silicon metal is the main raw material for silicone, semiconductor silicon, and synthetic quartz, and is produced by SIMCOA Operations Pty Ltd in Australia.

Synthetic Pheromones

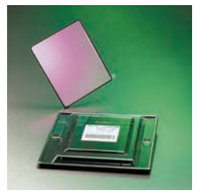
Synthetic pheromones are artificially synthesized from pheromones emitted by insects, and are used as environmentally friendly pest control agents as they obstruct the mating process between male and female pests, thereby suppressing reproduction.

Liquid Fluoroelastomers SHIN-ETSU SIFEL®

We were the first company in the world to succeed in developing the SHIN-ETSU SIFEL® liquid fluoroelastomers, which by using silicone addition-reaction technology can be made into a form that hardens into a flexible, solid synthetic rubber upon heating. It possesses excellent process ability and such superior properties as resistance to oils, solvents and chemicals together with good durability against heat and stability at cold temperatures, and is used in a wide range of fields, including automotive, aircraft, electronics and optical applications.

Pellicles

We provide high quality pellicles for use as dust protection covers for photomasks used in both ArF and KrF excimer lasers. In addition to having excellent light resistance properties and uniform rates of light transmittance, our pellicles have been thoroughly treated to ensure low outgassing. With these attributes, our pellicles support the increasingly intricate production of semiconductor devices. Furthermore, we also mass produce ultra-large pellicles used in flat panel display (FPD) manufacturing.

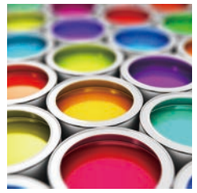


Anode Material of Lithium Ion Batteries

SiO is a greatly promising material as an anode material of next-generation lithium-ion batteries that have high capacity and excellent power properties. We have successfully improved battery characteristics by controlling the structure and surface of SiO particles and by developing our own lithium pre-doping technology.

SOLBIN®

SOLBIN is a copolymer resin from Nissin Chemical Industry Co., Ltd. that is prepared primarily from vinyl chloride and vinyl acetate, which are notable for their superior adhesiveness and solubility. It is mainly utilized in coatings, paints, inks and adhesives.



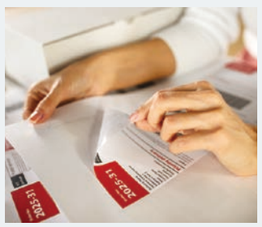
Topic

Strengthening the development of silicone products that contribute to SDGs and carbon neutrality

We are actively working to reduce greenhouse gases during silicone production and are strengthening our development of silicone products that contribute to SDGs and carbon neutrality.

For example, our reduced platinum reactive-type silicone release coatings used in seals, labels, and other types of release paper enable curing with half of the conventionally required amount of platinum, thereby contributing to resource conservation. In addition, our silicone rubber for molding that does not require post cure (heating treatment) contributes to energy conservation and reduction of greenhouse gas emissions while improving the quality and productivity of molded products.

Due to its molecular structure, silicone not only has a wide variety of features, but also offers a high degree of freedom in product design, which has led to active development of new products and new technologies. At present, the Group produces over 5,000 silicone products.



Silicone release paper used as backing for labels

Processing & Specialized Services

Meeting the diverse needs of customers by leveraging the advanced technological capabilities developed by the Shin-Etsu Group.

Using Our Products to Solve Societal Issues

- Creating a next generation mobile society by facilitating technological innovations in automobiles, such as the spread of automated driving and environmentally friendly vehicles
- Advancing IoT in society by developing communications infrastructure and improving the performance of facilities and equipment

Competitive Advantages

Shin-Etsu Polymer Co., Ltd.

- Comprehensive capabilities to handle everything from material development to processing as a member of the Shin-Etsu Group
- Technological capabilities to create high-valued-added products with core technologies in processing various resins

Shin-Etsu Engineering Co., Ltd.

- Technological capabilities to handle design, construction, and maintenance of domestic and overseas plants in-house

Mainstay Products and Applications

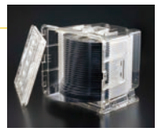
Shin-Etsu Polymer Co., Ltd.

Input Devices

Providing input devices for automobile steering, power windows, etc.

Wafer Cases

Providing cases for shipping silicon wafers and for inprocess wafer conveyance at device manufacturers.



Wrapping Films

Providing PVC wrapping films with superior stretchiness and excellent adhesive properties.

Topic

Increased production capacity of containers for 300 mm wafers

In anticipation of the expansion of semiconductor-related markets, we are expanding the production building at the Itoigawa Plant (Itoigawa City, Niigata Prefecture), which is our main plant of this product. Phase 1 of the area expansion kicked off in January 2023, with Phase 2 to be completed in 2024. As a result, we plan to increase production capacity by 20% compared to FY2022, rising to 40% in FY2024. In addition to establishing a more stable supply system, we are also working to strengthen the BCP system.

Shin-Etsu Engineering Co., Ltd.

Engineering

Shin-Etsu Engineering conducts plant design and construction and equipment maintenance for the Shin-Etsu Group.

Vacuum Assembling Equipment

Shin-Etsu Engineering also designs and manufacturers vacuum assembling equipment for LCD panels, enabling large-scale liquid crystal panel production.

Micro LED Chip Transfer Equipment

This equipment transfers micro-LED chips quickly and accurately, thereby promoting the widespread use of micro-LED displays.