

# Segment Information

## CHEMICALS



Tokuyama's Chemicals segment handles basic chemicals used as raw materials for an array of products that are essential for people's livelihoods. Among these are soda ash, which Tokuyama has been producing since its founding in 1918, and caustic soda, a material which is said to be "essential for the manufacture of products in factories." These and other chlorine derivatives are used in a very wide range of applications and are essential for all kinds of industries. The caustic soda business also plays an additional role in Tokuyama's earnings platform, as its manufacturing process generates chlorine and hydrogen that are used in processes for producing the Company's polycrystalline silicon. In addition, Yamaguchi Liquid Hydrogen Corporation, a joint venture for liquid hydrogen production, commenced operations in 2013. Through these operations, the Company's hydrogen is also used for rocket fuel at the Tanegashima Space Center of Japan Aerospace Exploration Agency (JAXA). In this way, the segment is contributing to the development of space exploration.

With the goal to continue ensuring that Tokuyama is the preferred choice of customers, the Chemicals segment oversees three business units and Group companies while working to provide a stable supply of products and services that meet the expectations and needs of customers in a timely manner.

Business Unit	Major Products
Soda Ash and Calcium Chloride	Soda ash, Calcium chloride and Sodium silicate
Chlor-Alkali and Vinyl Chloride	Caustic soda, Vinyl chloride monomer (VCM), Propylene oxide and Chlorinated solvents
New Organic Chemicals	Isopropyl alcohol (IPA)
Group Companies	Soda ash and Calcium chloride [Tokuyama & Central Soda Inc.] Polyvinyl chloride (PVC) [Shin Dai-ichi Vinyl Corp.]

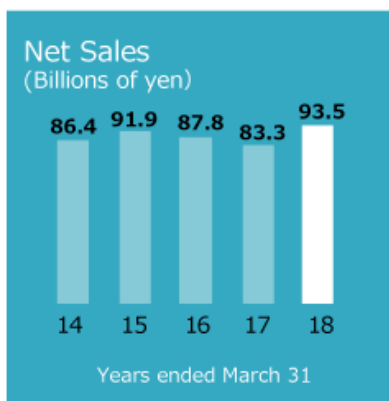
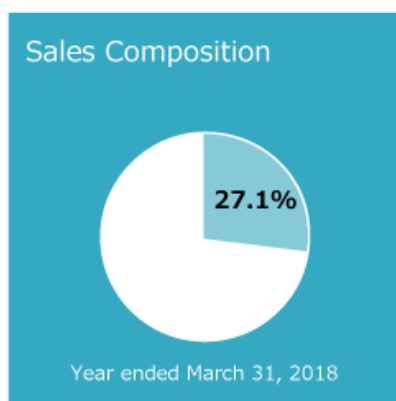
### Operating Results for the Fiscal Year ended March 31, 2018

Sales of caustic soda were up compared with the previous fiscal year both domestic sales and export volumes increased due to the upward trend of Asian market, and the revision of selling prices was also progressed.

Sales of vinyl chloride monomer (VCM) were up compared with the previous fiscal year. The volume of export mainly for Asian market increased and the selling prices were steady.

Sales of vinyl chloride resin increased. The revision of selling price was progressed.

As a result of the above, segment net sales increased 12.2% compared with the previous fiscal year, to ¥93,546 million and operating profit increased 24.4% to ¥16,175 million. The segment reported higher earnings on higher sales.



## Strategies Going Forward

Tokuyama will contribute to the development of customers' businesses by delivering high-quality, cost-competitive basic chemical materials and services that properly and promptly reflect customers' needs. At the same time, we will help to ensure the Company's stable and continuous earnings growth, all through our activities as the core business of the Company.

Guided by this basic policy, we will push forward the following priority measures.

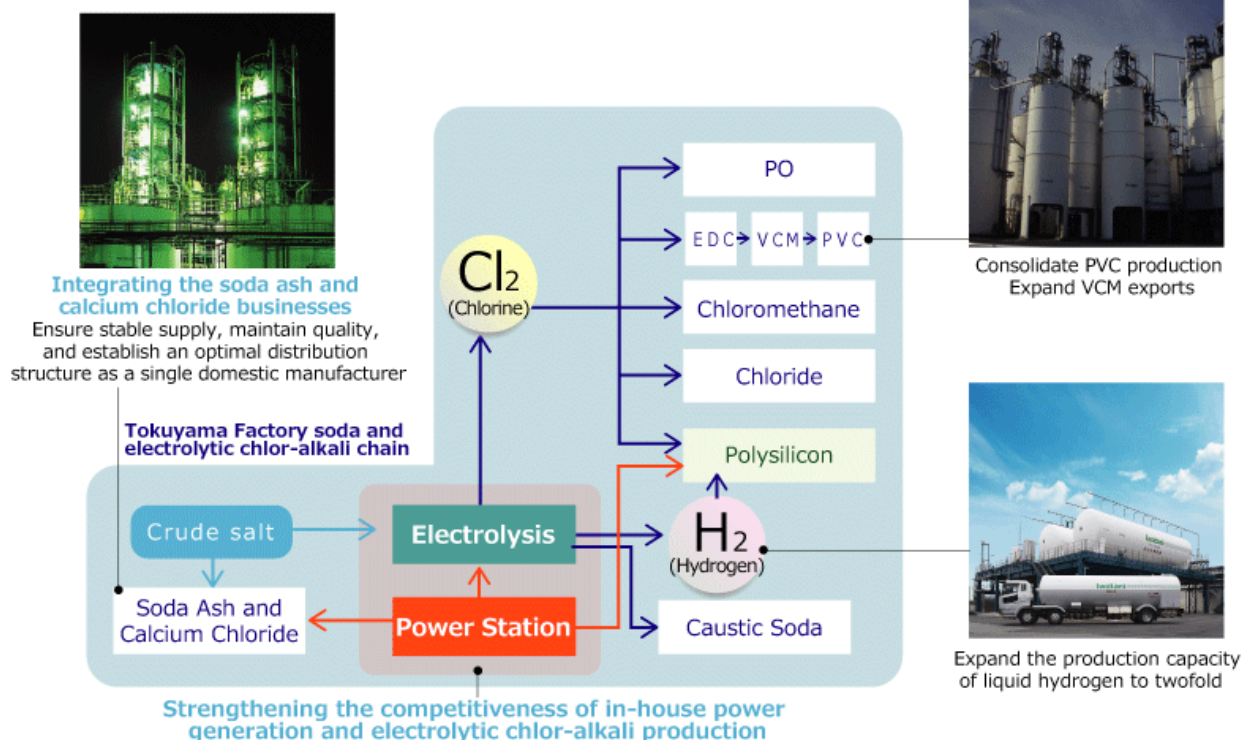
### ■ Soda Ash and Calcium Chloride Business

We will ensure the stable supply while maintaining the quality of products as a sole domestic manufacturer.

### ■ Chlor-Alkali and Vinyl Chloride Business

We will strengthen the competitiveness of our in-house power generation and electrolytic chlor-alkali production with the aim of further reducing the cost of caustic soda and chlorine. We will expand VCM exports and maintain plant operations at full capacity. At the same time, we will strengthen the profitability of the chlorine derivatives business including vinyl chloride, propylene oxide, and chloromethane.

## Activities Aimed at Reconstructing Businesses and Reinforcing Competitiveness



## SPECIALTY PRODUCTS



The Specialty Products segment offers products for a wide range of fields including energy, electronics and the environment. Our high-purity polycrystalline silicon is used for semiconductors and solar cells. Tokuyama is one of the leading companies in the world's polycrystalline silicon market. Fumed silica, which is produced from a by-product of polycrystalline silicon manufacture, is used for silicone rubber, polishing material for semiconductors manufacturing, copier toner and other applications. Aluminum nitride, which boasts excellent heat dissipation properties, is used for semiconductor production equipment and energy-saving applications such as inverters and LEDs. Our high-purity chemicals for electronics manufacturing are used chiefly for production of semiconductors and LCD panels.

The Specialty Products segment will continue to build on its advanced chemical technologies such as high purification, powder control and others, to create unique products that are useful to society.

Business Unit	Major Products
Electronic Materials	Polycrystalline silicon
Fumed Silica	Fumed silica and Tetrachlorosilane
Thermal Management Material	Aluminum nitride
IC Chemicals	High-purity chemicals for electronics manufacturing and photoresist developer
Cleaning System	Methylene chloride for metal cleaning
Group Companies	Fumed silica [Tokuyama Chemicals (Zhejiang) Co., Ltd.] Aluminum nitride substrate [Tokuyama-Dowa Power Materials Co., Ltd.] High-purity chemicals for electronics manufacturing [Taiwan Tokuyama Corporation]

### Operating Results for the Fiscal Year ended March 31, 2018

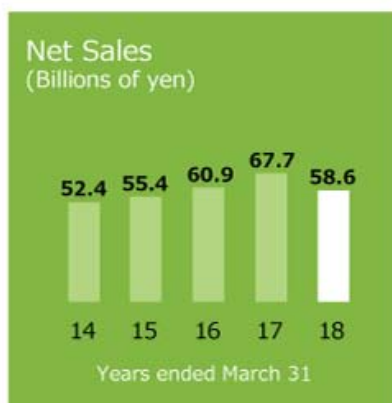
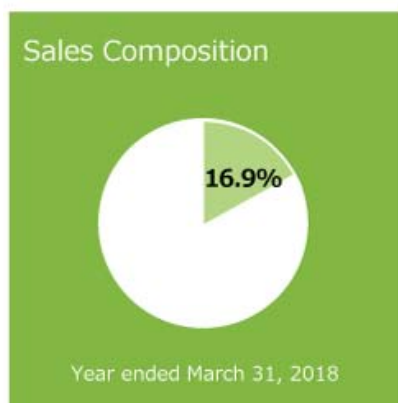
Sales of polycrystalline silicon decreased. Despite a robust sales volume of semiconductor-grade polycrystalline silicon, this was primarily due to removal of Tokuyama Malaysia Sdn. Bhd. from the Company's scope of consolidation.

Sales of fumed silica increased compared with the previous fiscal year due to increased sales of such applications as a polishing material for semiconductors.

With regard to high-purity chemicals for electronics manufacturing, sales increased compared with the previous fiscal year, mainly due to the robust sales volume in such applications as semiconductor manufacturing.

With regard to thermal management material, sales increased compared with the previous fiscal year. This was attributable to an increase in sales volumes of such applications used for semiconductor manufacturing equipment.

As a result of the above, segment net sales decreased 13.4% compared with the previous fiscal year, to ¥58,678 million and operating profit increased 19.4% to ¥11,003 million. The segment reported higher earnings on lower sales.



As a result of the above, segment net sales increased 11.2% compared with the previous fiscal year, to ¥67,726 million and operating income improved to income of ¥9,649 million (Posted operating loss of ¥1,157 million in the previous fiscal year). The segment reported higher earnings on higher sales.

### Strategies Going Forward

Tokuyama will expand business activities and earnings by supplying products and putting forward development product proposals that are consistently preferred by customers. To achieve this end, we will undertake the following priority measures.

#### ■ Semiconductor-grade Polycrystalline Silicon Business

We will accurately grasp the customers' quality requirements of products including the latest ones; achieve world-leading quality while minimizing costs.

#### ■ Fumed Silica Business

In addition to upgrading and expanding highly functional products on top of CMP-related and silicone-related products, we will try to reduce production cost and promote high added value at Tokuyama Chemicals (Zhejiang) Co., Ltd.

#### ■ IC Chemicals Business

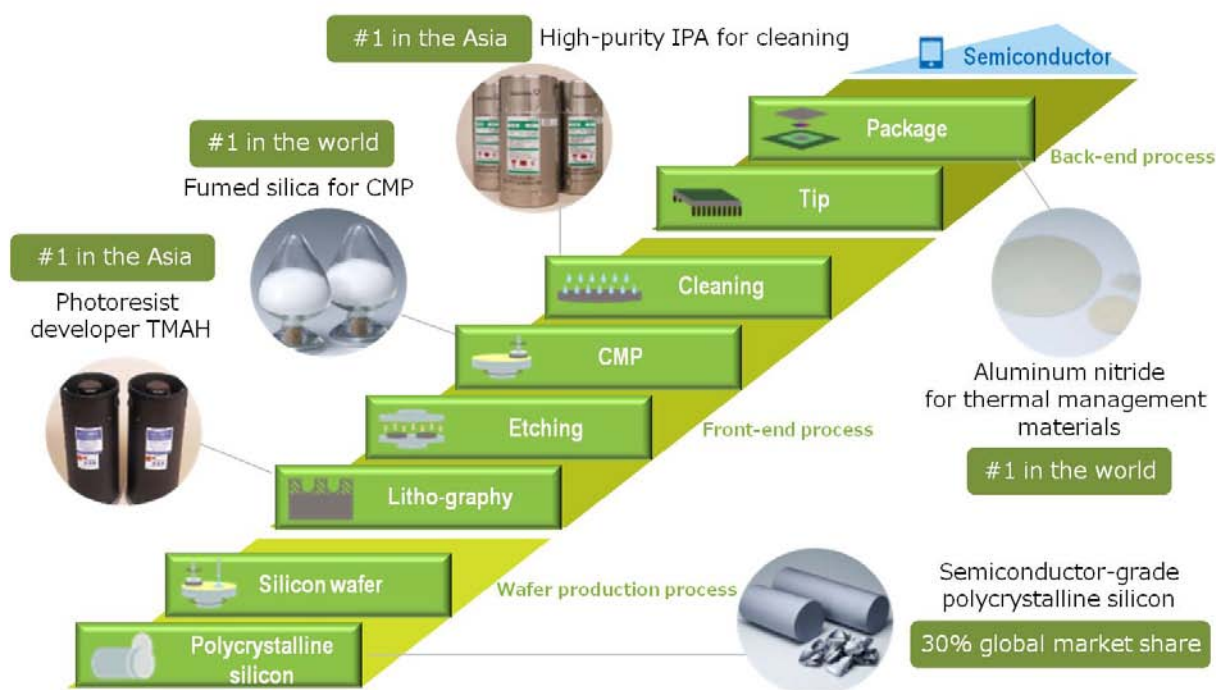
We will expand sales and improve the quality of products that target the advanced semiconductor field.

#### ■ Thermal Management Material Business

We have increased production capacity of aluminum nitride powder by 120 tons per year to 600 tons per year with the start of commercial operations in April 2018.

We will expand the product lineup such as the boron nitride and aluminum nitride filler.

### Tokuyama's Semiconductor-Related Products that Underpin Advances in ICT





## CEMENT



Tokuyama launched its cement business in 1938 out of a desire to efficiently make use of by-products produced at the Tokuyama Factory, an environmental approach that was ahead of its time in Japan. The segment produces cement and such related products as cement-type soil solidifiers at the Nanyo Plant of the Tokuyama Factory. These products are used for ready-mixed concrete and secondary concrete items, which in turn are used to help build infrastructure essential for people's lives, including residences, buildings, structures which support essential utilities, and transportation facilities such as ports, bridges, and roads.

In the cement production process, we accept a large volume of waste matter, including waste plastic and household garbage incineration ash from outside the Company as well as inside the Company, and utilize it as raw materials or fuel sources. In this way, the segment is promoting a recycling approach that is responsive to the needs of society, thereby helping promote a recycling-oriented society that effectively makes use of resources as much as possible.

Tokuyama Mtech Corporation manufactures and sells various types of building materials products including cement- and mortar-type products. Moreover, the Cement segment strives to develop products that can create new business possibilities by employing the technologies it has developed in the cement and building material fields. For example, steps are being taken to roll out Fresco Graph and other cutting-edge techniques that incorporate 3-D modeling technologies using Shikkui Lemarge interior design materials and other classic style fresco painting plaster techniques.

Business Unit	Major Products and Services
Cement	Cement, Ready-mixed concrete and Cement-type soil solidifier
Recycling and Environment	Resource recycling business
Group Companies	Cement and Ready-mixed concrete [Hiroshima Ready Mixed Concrete Co., Ltd and Tokuyama Tsusho Trading Co., Ltd., etc.]

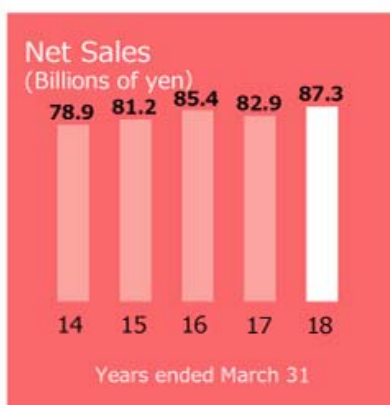
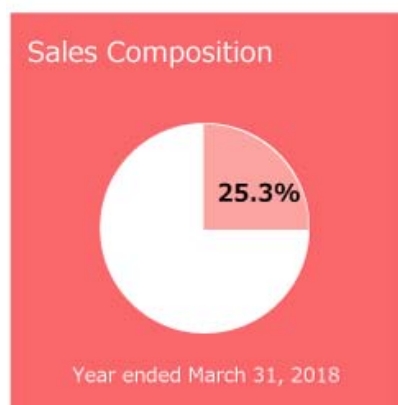
### Operating Results for the Fiscal Year ended March 31, 2018

Sales of cement increased. While the construction of infrastructure related to Tokyo Olympic was becoming more active, domestic sales increased at Tokyo and the other areas, and the volume of exports increased on the back of robust demand in the Asia region. Meanwhile, manufacturing costs increased due to a rise in raw material prices such as coal.

In the resource recycling business, despite the Company accepted a lower volume of waste, the waste disposable fees increased compared with the previous fiscal year. As a result of this, sales was almost same as the previous fiscal year.

Consolidated subsidiary net sales increased. This mainly reflected the robust shipping trends of such products as ready-mixed concrete.

As a result of the above, segment net sales increased 5.2% compared with the previous fiscal year, to ¥87,345 million and operating profit decreased 39.5% to ¥4,568 million. The segment reported lower earnings on higher sales.



## Strategies Going Forward

We will upgrade and build optimal production, sales, and distribution systems that are capable of flexibly addressing changes in the business environment, while maximizing waste acceptance earnings by increasing exports and working to strengthen competitive advantage by reducing costs. To achieve this end, we will undertake the following priority measures.

### ■ Cement Business

Tokuyama will improve production efficiency as well as unit consumption while reducing costs focusing mainly on efforts to increase the use/intake of waste. We will endeavor to secure earnings by expanding exports that maximize the use of the No. 4 kiln. Energies will also be channeled toward upgrading and expanding the infrastructure maintenance and reinforcement business through Tokuyama Mtech Corporation.

### ■ Recycling and Environment Business

We will optimize the application of raw materials and promote the use of combustible waste and optimize the fuel plant business. We will also promote stable operations in existing recycling businesses including the recycling of waste gypsum boards; create new recycling businesses.

## Expand Cement Clinker Exports



Clinker ship loader (Tokuyama Factory)



Tokuyama Nouvelle Calédonie S.A.

## LIFE & AMENITY



The Life & Amenity Division consists of Group companies that handle such wide-ranging products as polyolefin films, medical diagnosis systems, dental materials, ion exchange membranes and plastic window sashes. The Division is also in charge of the Tokuyama's fine chemicals and NF businesses. From April 2013, the Advanced Components segment was renamed the Life & Amenity segment.

In the fine chemicals business, utilizing our organic synthetic technology to advantage, we are expanding this business with eyeglass lens materials, active pharmaceutical ingredients for generic pharmaceuticals, and intermediates as our main products. In the NF business, we manufacture and sell air-permeable films (microporous films) that repel water but allow air and moisture to penetrate.

Shanghai Tokuyama Plastics Co., Ltd., one of the Group companies we are responsible for, manufactures and sells air-permeable films used for disposable diapers.

Business Unit	Major Products
Fine Chemicals	Active pharmaceutical ingredients and intermediates, Plastic lens-related materials
NF	Microporous film
Group Companies	Polyolefin film [Sun•Tox Co., Ltd.] Medical diagnosis systems [A&T Corp.] Dental materials/equipment [Tokuyama Dental Corp.] Ion exchange membranes [ASTOM Corp.] Plastic window sashes [Excel Shanon Corp.]

### Operating Results for the Fiscal Year ended March 31, 2018

With regard to dental materials and equipment, sales increased compared with the previous fiscal year, due to higher sales volumes of new products and an increase in the volume of export.

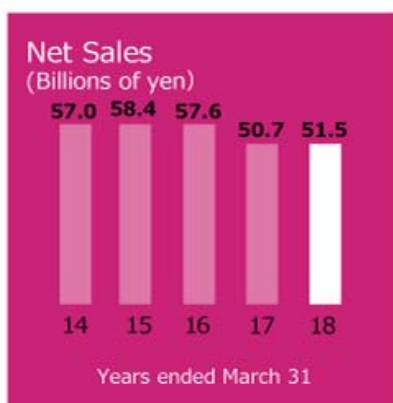
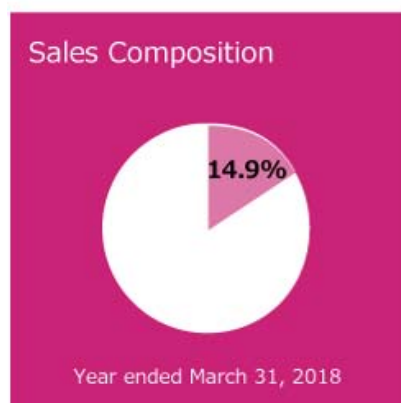
With regard to ion exchange membranes, sales were up compared with the previous fiscal year. This largely reflected the increase of sales on large-scale projects compared with the previous fiscal year.

Sales of active pharmaceutical ingredients and intermediates decreased compared with the previous fiscal year, owing mainly to the downswing in the sales volumes of generic pharmaceuticals.

With regard to microporous film, sales of such applications as sanitary articles including disposable diapers decreased at overseas subsidiaries. As a result of this, sales decreased compared with the previous fiscal year.

In gas sensors, Figaro Engineering Inc. was removed from the Company's scope of consolidation effective from the second quarter of the previous fiscal year. This reflected the transfer of a portion of the company's shares.

As a result of the above, segment net sales increased 1.6% compared with the previous fiscal year, to ¥ 51,579 million and operating profit decreased 30.8% to ¥ 3,728 million. The segment reported lower earnings on higher sales.



## Strategies Going Forward

Tokuyama is securing a position of advantage in markets both in Japan and overseas, pursuing business expansion, and contributing to the improvement of people's quality of life by establishing and strengthening its customer-oriented development, manufacturing, and sales structure. Driven by this policy, we will advance the following priority measures.

### ■ NF Business (Microporous Film)

We will endeavor to improve earnings by improving the quality and reducing costs at subsidiaries in China.

### ■ Fine Chemicals Business

We will expand market share and cultivate new applications in photochromic dye materials for use in eyeglass lenses.

### ■ Dental Materials/Equipment Business (Tokuyama Dental Corporation)

Steps will be taken to accelerate the pace of overseas business development focusing mainly on aesthetic filling materials (composite resins).

### ■ Polyolefin Film Business (Sun·Tox Co., Ltd.)

Every effort will be made to expand sales by using the manufacturing facilities implemented scrap and build.

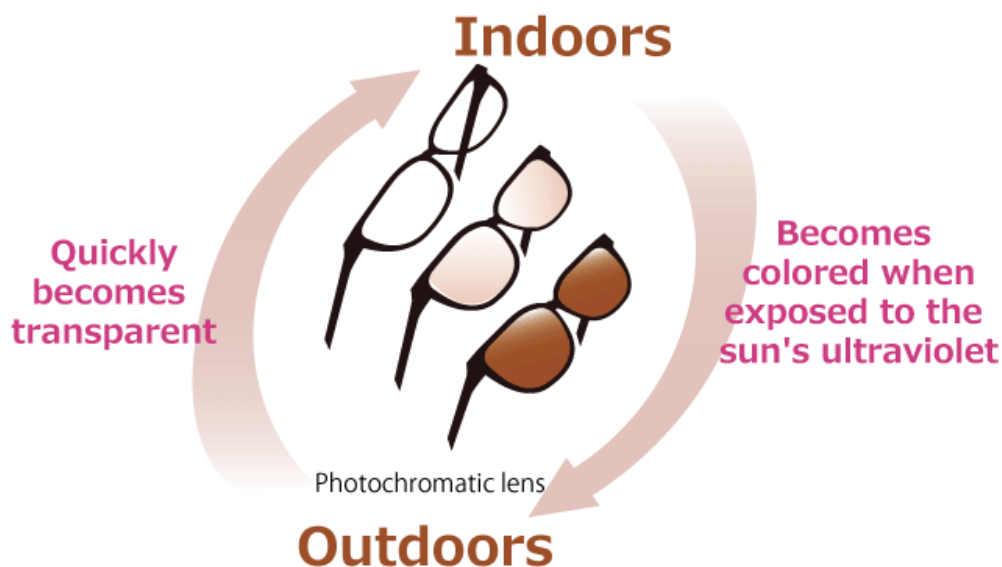
### ■ Plastic Sash Business (Excel Shanon Corp.)

We will expand Zero Energy House (ZEH)-related sales.

## Photochromic Dye Materials

### Photochromic Dye Materials

Photochromic dye materials are clear resins that change color to either gray or brown when exposed to the sun's ultraviolet rays, and return to their colorless state when no longer exposed



### Features of Our Products

- Offers a number of color variations and can be colored with the three primary colors of red, blue, and yellow
- Quickly changes between transparent and colored
- Allows users to see fully vivid colors even on hot summer days
- Highly durable
- Blocks over 99% of ultraviolet rays

