

CSR Report 2018

Corporate Social Responsibility Report



Creating a Better Future Through *Monozukuri*

 **CENTRAL GLASS CO., LTD.**

Business Outline of the Central Glass Group

Corporate Outline (as of March 31, 2018)

Company Name	Central Glass Co., Ltd.
Established	October 10, 1936
Number of Employees	1,666 (7,106 consolidated)
Capital	18,168.28 million
Listed Stock Exchange	Tokyo Stock Exchange

Central Glass Sales Co., Ltd.
 Central Glass Engineering Co., Ltd.
 Takada Co., Ltd.
 Tohoku Garasu Kenzai Co., Ltd.
 Bishu Silica Sand Co., Ltd.
 Mie Glass Industry Co., Ltd.
 Central Glass Plant Services Co., Ltd.
 Central Saint-Gobain Co., Ltd.
 Central Glass Module Co., Ltd.
 Japan Tempered & Laminated Glass Co., Ltd.
 Central Chemical Co., Ltd.



Carlex Glass Luxembourg, S.A. (Luxembourg)
 Central Glass Germany GmbH (Germany)
 Central Glass Europe Limited (UK)
 Apollo Scientific Limited (UK)
 Central Glass Czech s.r.o. (Czech)

Europe



Japan

Asia



Taiwan Central Glass Co., Ltd. (Taiwan)
 Yue Sheng Industrial Co., Ltd. (Taiwan)
 Giga Gas & Electronic Materials Company (Taiwan)
 Giga Gas & Electronic Materials (Singapore) Pte. Ltd. (Singapore)
 Giga Gas & Electronic Materials Trading (Shanghai) Co., Ltd. (China)
 Central Glass (Zhangjiagang) Co., Ltd. (China)
 Zhejiang Central Glass Chemspec Company Ltd. (China)

Central Glass Trading (Shanghai) Co., Ltd. (China)
 Saint-Gobain Central Sekurit (Qingdao) Co., Ltd. (China)
 JCEL Co., Ltd. (South Korea)
 Central Glass Korea Co., Ltd. (South Korea)
 Central Glass Company India Private Limited (India)
 Japan Vietnam Fertilizer Company (Vietnam)

Major Products of Each Segment

Glass Business	Architectural glass	Float glass, figured glass, wired glass, heat reflective glass, fabricated glass (tempered glass, heat-resistant glass, laminated glass, insulating glass units, security glass), mirrors, anti-fog mirrors, decorated glass, screen glass
	Automotive glass	IR-cut glass, UV-cut glass, glass antennas, privacy glass, module glass, acoustic glass, defogging glass, head-up display glass, and other various safety glasses
	Glass for electronic materials	Thin flat glass for LCDs, chemical tempered glass, powder glass and glass paste
Chemicals Business	Basic chemicals	Fluorocarbon products, polyaluminum chloride, gypsum, hydrofluoric acid
	Fine chemicals	Active ingredients & intermediates for pharmaceuticals/agrochemicals, fluorinated organic/inorganic compounds, high-purity fluorine gases, electronic materials, electrolytes for lithium-ion batteries, fluorinated organic/inorganic reagents
	Fertilizers	NPK compound fertilizer, NK compound fertilizer, coated fertilizer, organic chemical fertilizer, fertilizer materials, microbiological plant-protection agents/materials
	Glass fiber	Glass fiber, glass wool

Central Glass Fiber Co., Ltd.
 Tosho Central Co., Ltd.
 Ube Trading Co., Ltd.*
 Sowa Transportation and Warehouse Co., Ltd.

Central Engineering Co., Ltd.
 Ube Analytical Center Co., Ltd.
 Ube Yoshino Gypsum Co., Ltd.
 Central Insulation Co., Ltd.

*Ube Trading merged with Tosho Central on April 1, 2018 and after merging changed its corporate name to Tosho Central Co., Ltd.



Carlex Glass America, LLC (US)
 Central Glass America Inc. (US)
 Northwestern Industries, Inc. (US)
 SynQuest Laboratories, Inc. (US)
 Central Glass International, Inc. (US)

North America



List of Business Sites

Head Office	Kowa-Hitotsubashi Bldg., 7-1 Kanda-Nishikicho 3-chome, Chiyoda-ku, Tokyo, Japan
Chemical Research Center	17-5 Nakadai 2-chome, Kawagoe City, Saitama
Chemical Research Center (Ube)	5253 Okiube, Ube City, Yamaguchi
Glass Research Center	1510 Okuchi-cho, Matsusaka City, Mie
Ube Plant	5253 Okiube, Ube City, Yamaguchi
Matsusaka Plant	1521-2 Okuchi-cho, Matsusaka City, Mie
Matsusaka Plant Sakai Mfg. Site	6 Chikko-minamimachi, Sakai-ku, Sakai City, Osaka
Kawasaki Plant	10-2 Ukishima-cho, Kawasaki-ku, Kawasaki City, Kanagawa

Contents

Business Outline of the Central Glass Group	2
President's Message	4
CSR at the Central Glass Group	6
Products of the Central Glass Group	8
Special Feature: Social Contributions Through Central Glass Technology	10
Corporate Governance	12
Environment, Safety & Quality Management	16
Environment and Safety	19
Quality	24
Employees	26
Society	30
Activities at Individual Plants	32

Editorial Policy

Our second CSR Report aims to accessibly provide more comprehensive information about engagement with all of the Central Glass stakeholders from our customers, business partners, and investors to employees and members of the local communities.

Reference Guidelines

- Environmental Reporting Guidelines 2012 of the Ministry of the Environment
- Responsible Care Code of the Japan Responsible Care Council (JRCC)
- ISO 26000 (Guidance on social responsibility)

Report Period

April 2017 to March 2018

(The period for information related to health and safety as well as social and environmental activities of overseas affiliates was from January to December 2017.)

Scope of the Report

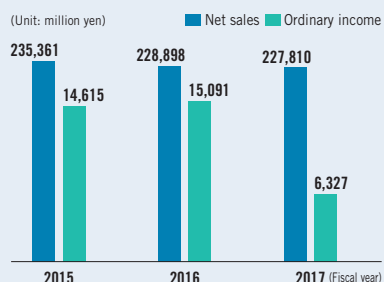
The Central Glass Group (Data was only gathered from the plants, research centers, and headquarters of Central Glass Co., Ltd. along with some of our domestic and overseas affiliates.)

What Is Responsible Care?

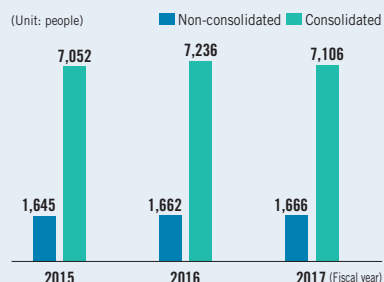
Most chemical companies voluntarily work to secure the environment, safety, and health throughout every process, from the development stage of chemical substances to their manufacture, distribution, use, final consumption, and lastly their disposal. Those companies then publicize the results of their activities to engage in dialogue and communication with society. These activities are referred to as Responsible Care.



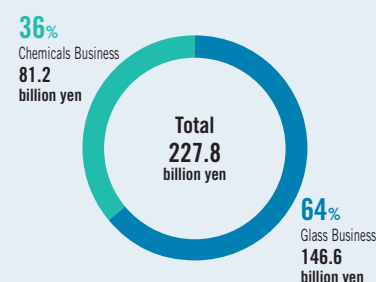
Trends in Net Sales and Ordinary Income (Consolidated)



Trends in the Number of Employees



FY2017 Sales by Segment (Consolidated)



Contributing to the Establishment of a Truly Prosperous Society Through *Monozukuri*

Philosophy and Policies

The Central Glass Group Corporate Philosophy includes a Basic Philosophy and Basic Policies intended to create a better future through *Monozukuri*. The Group will contribute to the establishment of a truly prosperous society through the spirit of *Monozukuri*. *Monozukuri* is a concept encompassed in all of our corporate activities from research and development to manufacturing and sales as a sincere business practice which forms the foundation of Central Glass.

The four Basic Policies illustrate the specific direction the Group should endeavor to achieve our Basic Philosophy: (1) create new value through innovative technologies, (2) grow together with society while remaining environmentally friendly, (3) endeavor to increase corporate value with global growth as our driving forces, and (4) aim to be a vibrant enterprise with a pioneering spirit and respect for diversity.

Achieving the above Corporate Philosophy fulfills the corporate responsibility of Central Glass, which exists as a company dedicated to *Monozukuri*. Therefore, we have drafted a Code of Conduct for our employees to follow. We will continue to further business activities centered on realizing our social responsibility while deepening cooperation and coordination with all of our stakeholders.

Compliance

We must adhere to laws and regulations as a prerequisite to the expansion of our businesses, and therefore, compliance is an indispensable requirement to fulfilling our corporate social responsibility.

We continually heighten the transparency and fairness of overall management, and strive to establish an efficient and rational organizational structure that can respond swiftly to changes in the business environment in order to further en-

hance corporate value and expand revenue. We observe the entirety of the Corporate Governance Code and have adopted an executive officer system that clearly distinguishes the auditing duties of Directors from the business-execution duties of Executive Officers in order to ensure the appropriateness and efficiency of our business.

We are also enriching understanding of compliance among our employees through educational and awareness-raising activities conducted by our Compliance Promotion Committee.

Optimizing Human Resources

We have also developed our educational systems in accordance with our belief that *Monozukuri* starts with *Hitozukuri*—the development of human resources—including those for employee development and the training of global human resources. Additionally, in order to promote diversity, we are working actively to provide opportunities for non-Japanese employees.

We believe maintaining and improving working environments in which our employees can feel safe and secure is essential to the sound development of our business. Therefore, we have introduced a system that prohibits employees from working extended hours beyond the prescribed limit. Furthermore, since FY2009, we have been operating a system under which all employees receive stress checks and consult with specialists if any problems are discovered.

We have been developing systematic measures to actively support employees who are raising children or caring for family members by creating a workplace environment that allows employees to work without undue worry.



// Promotion for the Active Participation of Female Employees

Many of our *Monozukuri* processes are operated with equipment that runs 24 hours. Up until recently, Central Glass had not been actively employing women at manufacturing sites due to working conditions such as a three-shift system that includes late night shifts. This has resulted in a total employee gender ratio skewed toward men. However, with the active participation of women as a major social theme, we are putting our strength into employing women who can actively participate at manufacturing sites today. We are consciously working to build an environment where women can work comfortably in every position whether in research and technology or in administration. We will continue to further innovations and reforms that incorporate the perspective of women.

// Midterm Plan

Central Glass has formulated the new Midterm Plan for the next three years from FY2018 to FY2020. Considering the targets that were not achieved in the previous medium-term management plan, the new Midterm Plan aims to recover operating profits, which are the driving force to business, and emphasizes an operating profit ratio that demonstrates efficiency. We have set the ROE to 6% according to target earnings, but this is only an initial objective toward achieving our final target of over 8%, and we will strive to further heighten this return on investment. Moreover, through the cash that is generated, we will continually provide stable dividends to our shareholders and advance investments as well as research and development to foster further growth.

In the glass business, the Japanese markets are maturing and overseas markets are also growing, but competition is fierce both in Japan and overseas. The Group will be thorough

in reducing costs, aggregating equipment, and driving productivity as well as efficiency while furthering a return on capital investments.

In the chemicals business, we will invest primarily overseas in electrolytes for lithium ion batteries to gain a strong entry into the startup phase of the electric vehicle market in addition to aggressively increasing focus on growth sectors, such as electronic materials for semiconductors as well as low GWP fluorine blowing and cleaning agents.

Going forward, the Group will fulfill our corporate social responsibilities by contributing to the growth of society through sincere *Monozukuri* activities without losing our global perspective.

We look forward to the ongoing understanding and support from all of our stakeholders as we move into the future.

Tadashi Shimizu
Representative Director, President & CEO
Central Glass Co., Ltd.

Realizing Our Corporate Philosophy

The Central Glass Group defines CSR as achieving our Corporate Philosophy. Cooperation and collaboration with our many stakeholders is essential in order to fulfill our social responsibility through our Basic Philosophy and Basic Policies founded in observance to our Code of Conduct. The Central Glass Group strives to fulfill the Corporate Philosophy in all of our activities.

Corporate Philosophy of the Central Glass Group

The Corporate Philosophy of the Central Glass Group is composed of a Basic Philosophy and Basic Policies. *Monozukuri* refers to all of our business activities from research and development to manufacturing and sales. The Group places this concept as the core of our corporate activities since our founding and it is the platform from which we will further advance forward into the future. The Basic Policies are specific measures to push the Group in a direction that actualizes our Basic Philosophy.

The Corporate Philosophy embodies the beliefs of the Central Glass Group that should be communicated to all of our stakeholders, in addition to being the central axis of the corporate activities conducted by the Group. We believe this philosophy strengthens our solidarity and capabilities as a Group.

Corporate Philosophy

Basic Philosophy

Creating a Better Future Through *Monozukuri**

The Central Glass Group will contribute to the establishment of a truly prosperous society through the spirit of *Monozukuri*.

* *Monozukuri* refers to all the business activities in which the Central Glass Group engages with a basic stance of integrity and sincerity, including R&D, quality oriented manufacturing, and sales.

Basic Policies

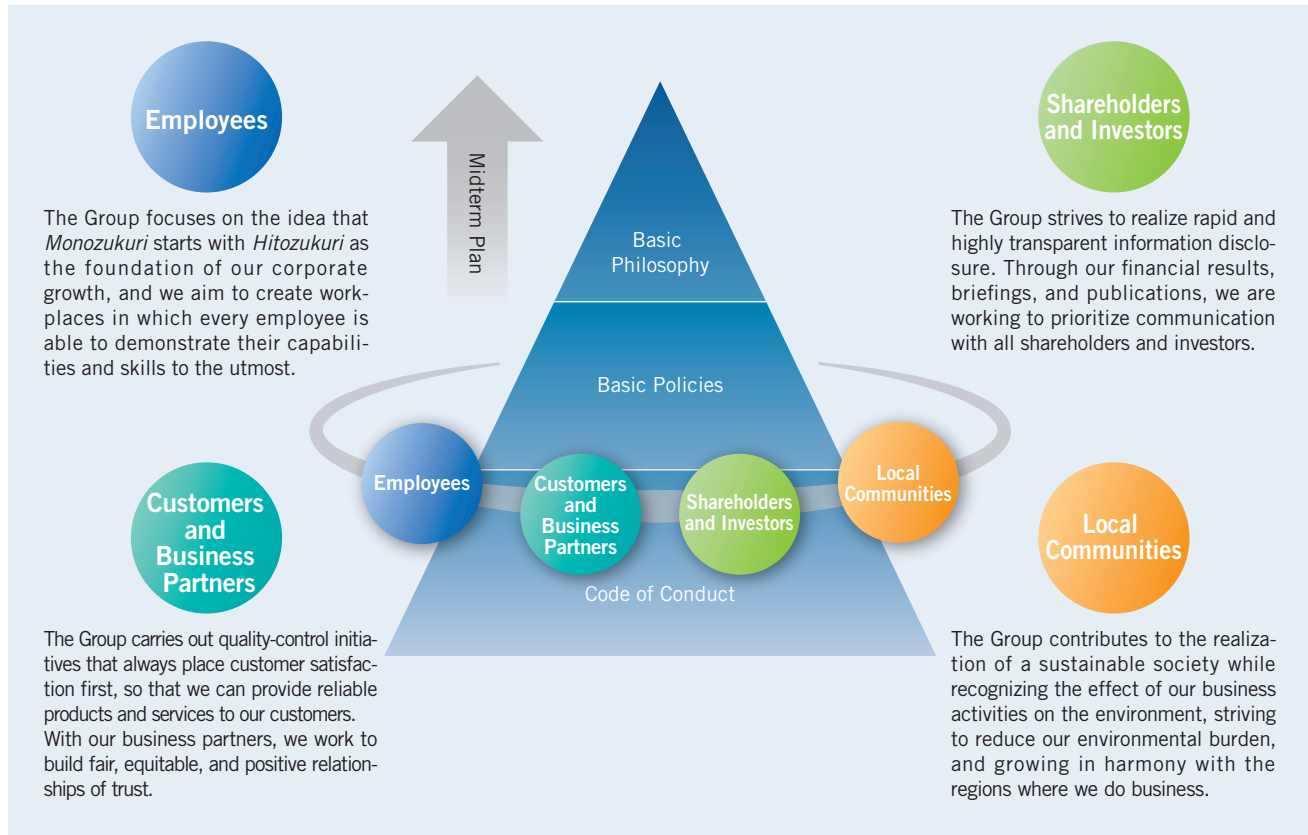
- Create new value through innovative technologies.
- Grow together with society while remaining environmentally friendly.
- Endeavor to increase corporate value with global growth as our driving forces.
- Aim to be a vibrant enterprise with a pioneering spirit and respect for diversity.

Code of Conduct

1. Take responsibility for one's own actions, and engage in honest corporate activities.
2. Refine one's awareness, and constantly pursue original ideas and technologies.
3. Achieve the establishment of a society in which all people can live in comfort and good health, and protect the global environment.
4. Create products that satisfy customers all over the world by learning about different cultures and customs.
5. Respect the diversity of every individual, and never cease to embrace the challenges of the future.

CSR System at the Central Glass Group

The Central Glass Group will fulfill our corporate social responsibilities through continual improvement efforts utilizing a PDCA cycle for every activity based on the CSR system outlined below.



Midterm Plan (FY2018-FY2020)

Central Glass has formulated a Midterm Plan for the next three years from FY2018 to FY2020.

This plan raises the need to act quickly throughout the entire Group to anticipate and be ready for environmental changes after the medium term.

Basic Policies

Achieve new growth by strengthening our business foundations and original technologies.

- Strengthen our business foundations by clarifying and focusing on our priorities.
- Deliver added value by anticipating the needs of customers and society.
- Ensure compliance and contribute to the development of society as a global corporation.

Basic Strategies

1. Return to a medium- to long-term growth path.

- Pursue returns by selectively allocating management resources to business fields targeted for growth.
- Secure funding for growth investments through restructuring according to business and organizational characteristics.
- Boost earning power and efficiency as well as improve cash flows through carefully selected investments.

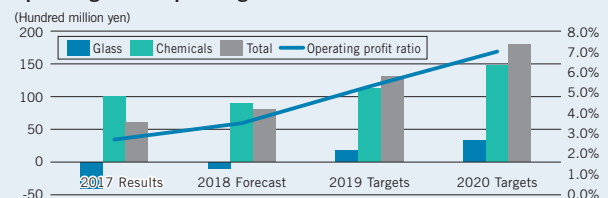
2. Distribute cash flows based on a well-balanced consideration of shareholder returns, investments and financial discipline.

3. Continue strengthening R&D to ensure future growth.

Management Target

	FY2017 Results	FY2020 target in the Midterm Plan
Operating profit	6 billion yen	18 billion yen
Operating profit ratio	2.7%	7.0% or more
ROE	1.7%	6.0%
Total return ratio to shareholders	68%	At least 30%

Operating Profit/Operating Profit Ratio



Products of the Central Glass Group

The Central Glass Group supplies products related to the fields of glass and chemicals. Although the products of the Central Glass Group may be unnoticeable to the general consuming public, the Group supports many aspects of a comfortable daily life, as well as of a well-functioning society and industry. We provide raw materials for glass products used in commercial buildings, residences and automobiles, as well as raw materials for industrial products, materials supporting industrial production processes, fertilizers, and pharmaceutical products. The Central Glass Group is continually pursuing possibilities for the manufacturing and technologies in which we excel, along with taking on the challenges of new fields in the future in order to develop and provide environmentally friendly products and products that take people's health and safety into consideration.



Glass

① Architectural Glass

Glasses like eco-glass, security glass, and soundproof glass that save energy and contribute to more comfortable interiors.

② Automotive Glass

Laminated glass and tempered glass for automotive windows, and high-performance glass such as heat-insulating glass that contributes to environmental protection.

③ Glass for Touch Panels

Ultra-thin glass for touch sensor panels and cover glass.

④ Lead-Free and Anti-Fog Mirrors

Environmentally friendly lead-free mirrors that do not contain the harmful components usually used in back coatings, and anti-fog mirrors with special coatings applied to their surfaces in order to prevent fogging.

⑤ Transparent Screen Glass (Auroverre®)

Glass screens that combine the transparency of glass with the ability to project images.

Agri-Bio

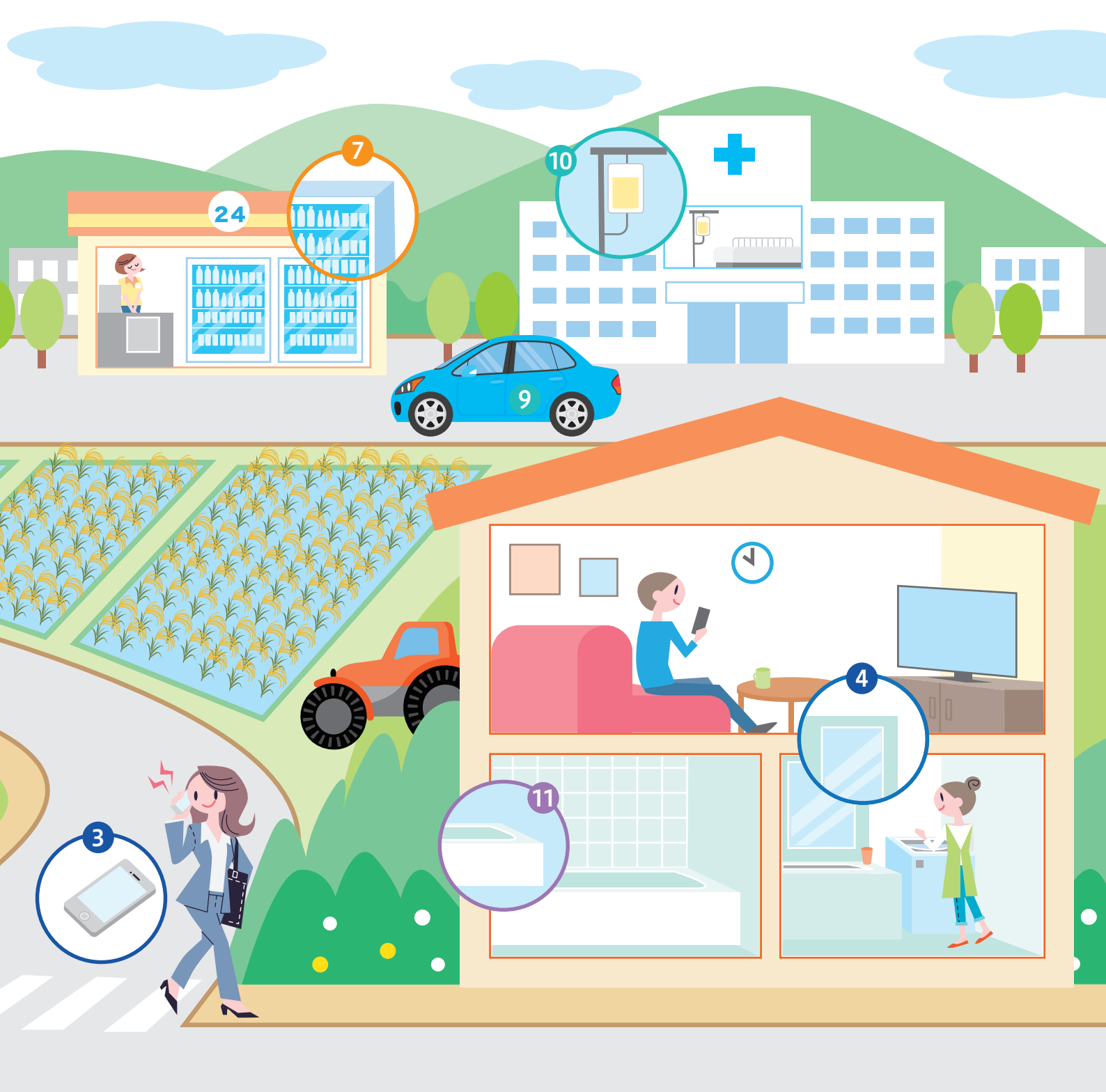
⑥ Environmentally Friendly Agricultural Materials

Coated Fertilizer Cera-coat®

A controlled-release fertilizer developed based on the concepts of an ideal fertilizing effect, labor saving, low cost, and environmental friendliness. Highly effective, so less of the product needs to be used.

Microbial Control Agents

Anti-microbial agricultural chemicals suitable for organically or specially cultivated agricultural products. Extremely safe for humans, animals, and crops. Can be used until just before harvest, without being counted as pesticide use.



Basic Chemicals

7 Urethane Foam Blowing Agents

One of the materials for the heat-shielding rigid urethane foam used in refrigerated equipment such as showcases.

Fine Chemicals

8 Fluorine Products for Electronic Materials

Fluorine-based process gases, cleaning gases, and resist materials employed in the production of semiconductors and LCD panels used in computers and smartphones.

9 Electrolytes for Lithium-Ion Batteries

For applications such as electric vehicles (EVs) and hybrid vehicles.

10 Active Ingredients & Intermediates for Pharmaceuticals

Active ingredients and intermediates for pharmaceuticals such as anesthetics and antiulcer drugs utilizing fluorine chemicals and other technologies developed in-house.

Glass Fiber

11 Resin-Reinforced Materials (bathtubs, etc.)

Glass fiber widely used in such diverse applications as fiber-reinforced plastic for bathtubs, housing, automobiles, ships, and electronic products.

12 Automotive Sound-Absorbing Materials

Glass wool, a noncombustible, fire-resistant material used for heat insulation and sound absorption in automobiles, railcars, etc.

Social Contributions Through Central Glass Technology

Central Glass technology contributes to society in various areas of daily life. In this special feature, we will introduce the successes of the hard work in research and development conducted over the last several years to improve the effective use of resources and enhance automotive safety.

Chemicals Business

Reception of the Ministry of Economy, Trade and Industry Award for Resources Recirculation Technologies and Systems

In-house Development of Technology to Recover Raw Fluorite from Waste Fluorine Resources

The Ube Plant received the 43rd Award of the Director-General of the Industrial Science and Technology Policy and Environment Bureau 2017 on October 20, 2017 at the Ministry of Economy, Trade and Industry Awards for the Resources Recirculation Technologies and Systems commendation ceremony held by the Japan Environmental Management Association for Industry Resources Recycling Promotion Center.

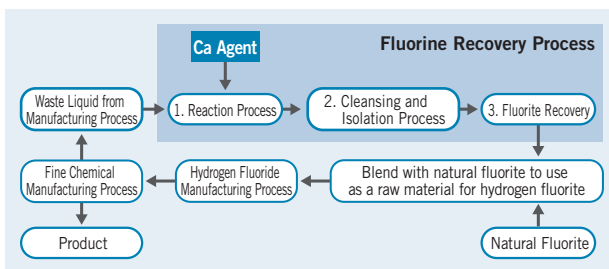
This award contributes to the reduction of the production of waste, reuse of goods spent, and effective use of renewable resources (Reduce, Reuse, Recycle; 3R) and aims to promote environmental businesses by broadly publicizing and commemorating businesses and initiatives which have shown

excellence in advanced technologies and innovative systems to encourage their adoption and standardization.

The Ube Plant developed technology in-house to recover raw fluorite from waste fluorine discharged during the manufacturing of medical products. This technology succeeded in reducing the use of natural fluorite. This initiative received the award above in recognition of the great contributions toward the establishment of a resource-recycling society.



Fluorine Recovery Process



Reaction Formula for the Recovery of Fluorine
 $HF + Ca \text{ Agent} = CaF_2 \text{ (Fluorite)}$

Explanation of Fluorine Recovery Process

- 1. Reaction Process** The wastewater containing fluorine discharged from the manufacturing process reacts with the calcium agent (Ca agent) and synthesizes fluorite.
- 2. Cleansing and Isolation Process** The fluorite obtained from this reaction process is cleansed and placed in a separator to isolate and purify fluorite to the same quality as natural fluorite.
- 3. Fluorite Recovery** The recovered fluorite obtained from this cleansing and isolation process is used as an alternative to natural fluorite, which is a raw material for hydrogen fluoride.



Yutaka Ishii
 Engineering Dept. Ube Plant

The recovery of resources is a major challenge in shaping a recycle-oriented society. That is why we introduced the recovery process outlined on the left in 2013. It was a long wait to apply for this award as it required more than three years of actual performance to prove the concept. Our technology was strictly scrutinized from the screening of our materials to on-site inspections and presentations before we received this award.



Currently, I am involved with construction operations at the plant, and I hope to build a more environmentally-friendly plant by taking advantage of this experience.

Yamaguchi Prefecture Eco Factory Certification

Yamaguchi Prefecture grants certification as Eco Factories to business establishments that continually engage and succeed in recycling and reducing the production of industrial waste. The Ube Plant was recognized for its 3R efforts, including the fluorine recovery above, and certified as a new Eco Plant in FY2017.



Solution to Double Images in the Heads-up Display (HUD) Projected onto the Windshield of Subcompact Cars

Succeeded in Mass Production for the First Time by Guaranteeing the Quality of Glass Display through Inspection of All Pieces of Glass

HUD projects information required for driving such as speed, navigation and warnings in front of the driver. It enhances safety by reducing eye movement and the time for the eyes to adjust the focal distance. In particular, the adoption of the type of HUD that projects information onto the windshield is being adopted more and more in recent years for benefits such as little visual movement and the display of information in a natural position.

An image projected onto the glass of a standard windshield caused the problem of a double image due to a reflection both on the interior glass surface and exterior glass surface of the vehicle. Using a wedge-shaped interlayer for the cross-section of the windshield glass eliminated the double image to provide a clear projected HUD image.

However, the geometry of the glass surface had to be controlled with a high-level of precision because if the manufactured glass surface deviated from the design values, the images displayed on the HUD would be defective, showing distortion

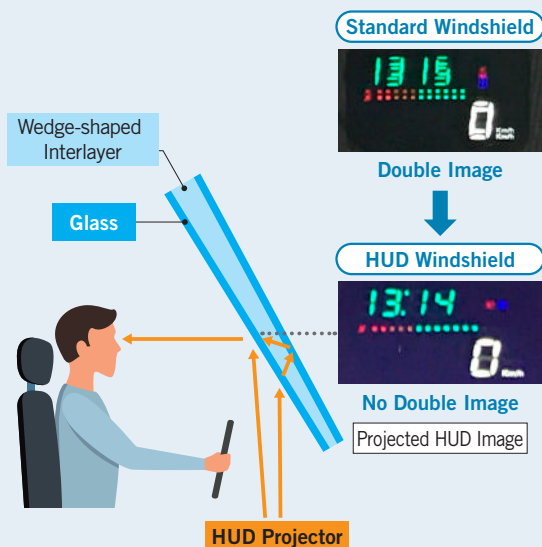
or broken images. In addition, a higher level of control was required due to the limitations of design in subcompact cars due to their small size. We were also required to inspect the display quality of each windshield because the requirements for high-quality display images were strict.

Therefore, we decided to adopt a pressing method to more closely reproduce the design values for the glass surface, as well as to control the geometry of the glass surface more precisely through methods such as heightening the accuracy of the press mold even further. We also developed an inspection device of HUD images in-house with the cooperation of the HUD display manufacturers and built a system able to fully inspect the quality of the glass display, succeeding in the mass production of the first HUD windshield in subcompact cars.

The needs of automotive glass are diversifying, and the geometry of glass surfaces will become much more precise and grow in complexity. We will continue to drive technological development to respond to these needs.

Principles of HUD Using the Wedge-shaped Interlayer

The wedge-shaped interlayer eliminated the double image caused by the overlay of images reflected on the interior windshield surface and exterior glass surface of the vehicle.



VOICE

Kohei Edamura

Staff Engineer Automotive Glass Group
Glass Manufacturing Technology Center

The front windshield projection HUD was pioneered in Europe and had already become an established technology. However, the success of adoption was low in Japan and there were many design limitations due to the small size of the subcompact cars uniquely common to Japan. These design limitations could not be overcome through only conventionally established technology.

During the initial development, many of the members involved with the European affiliate that mass produces windshields for vehicles with HUD pointed out the extremely high degree of difficulty compared to the previously mass produced glass. As they predicted, we had to overcome great obstacles several times throughout the development. However, my team members grasped for solutions and were able to clear the requirements to realize mass production. We gained an abundance of knowledge through persistent hard work. I want to utilize this experience in the development of windshields for future vehicle models with HUD.





To Increase Transparency and Fairness of Overall Management

The Central Glass Group has established a corporate governance structure to increase transparency and fairness of our overall management as well as to improve efficiency and speed. We carry out initiatives to raise all employees' awareness of compliance in order to practice sincere corporate activities.

Corporate Governance

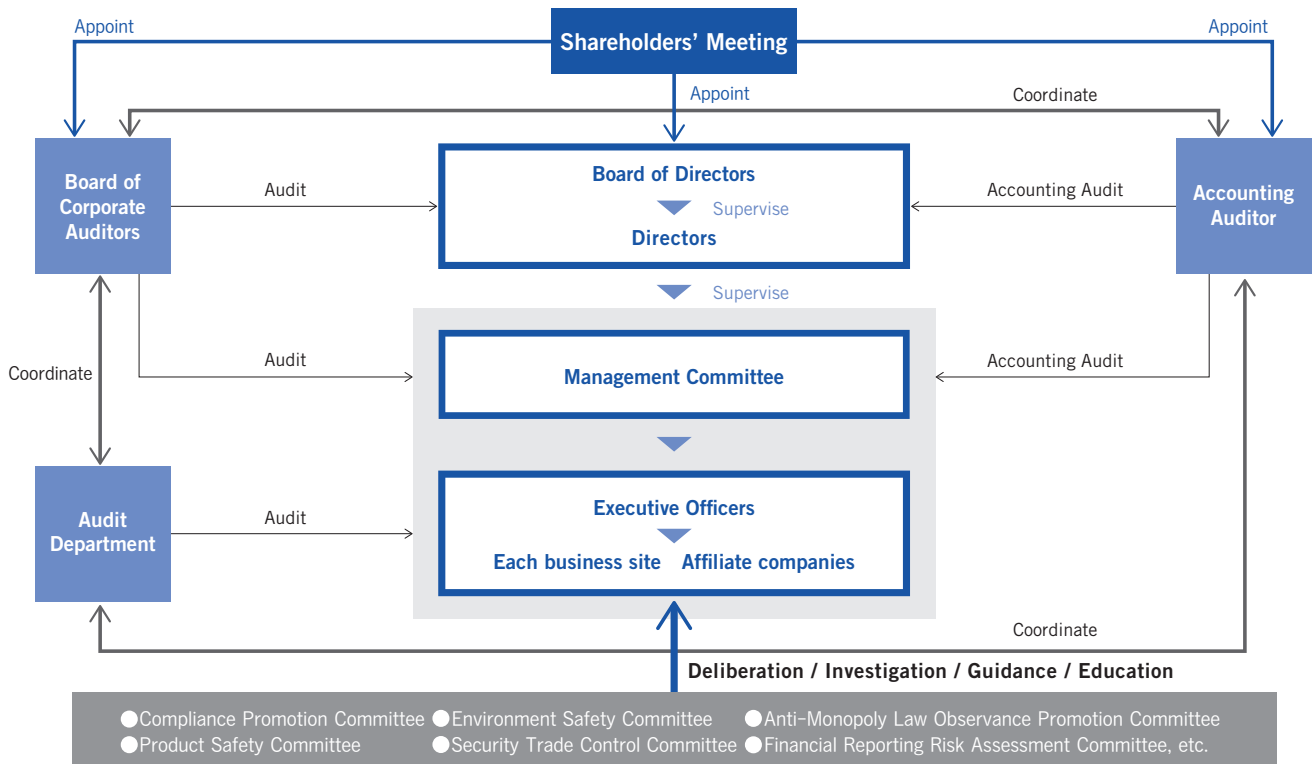
Central Glass is continually increasing transparency and fairness of our overall management, and strives to establish an efficient and rational organizational structure that can swiftly respond to changes in the business environment in order to further enhance our corporate value and expand our revenue. This is our fundamental concept of corporate governance.

Based on this concept, we position our Board of Directors and Board of Corporate Auditors as the foundation of our corporate governance. In addition, we have adopted an executive officer system. By separating decision-making regarding important business matters, the supervision of business execution, and the actual execution of business, we have slimmed down the Board of Directors to make management more efficient and prompt.

Central Glass, in addition to an Accounting Auditor, has an Audit Department for the purpose of internal auditing, which conducts audits of the full range of activities of Central Glass and our affiliates, and reports its findings to the Representative Director and the Board of Corporate Auditors.

The Board of Corporate Auditors, the Accounting Auditor, and Audit Department staff hold meetings periodically, exchange information and opinions, ensure coordination, and share problems to embrace and rationalize the auditing process.

Organizational Chart for Corporate Governance



Board of Directors

As a rule, the Board of Directors meets once a month, or when necessary, to deliberate and resolve legal and important managerial issues in line with Central Glass regulations covering the Board of Directors, and supervises the execution of business by the Directors and Executive Officers including the Representative Director.

To enhance the audit and supervision function of the Company, Independent Outside Corporate Auditors and Outside Directors, who have no potential for a conflict of interest with ordinary shareholders, ensure fair and consistent decision-making by the Board of Directors.

Management Committee

The Management Committee generally meets once a week, in line with the regulations governing its activities, to deliberate and resolve important issues affecting the execution of business, and to deliberate proposals to be put forward to the Board of Directors.

Board of Corporate Auditors

The Board of Corporate Auditors generally meets once a month to deliberate and resolve important auditing issues. Corporate Auditors also share information and frequently exchange opinions with each other. They also meet periodically with the Representative Director to discuss important matters of management and auditing.

The Corporate Auditors attend important meetings such as those of the Board of Directors, and audit the performance of duties by the Directors and Executive Officers, as well as the performance of duties of each department and affiliate of the Group.

Audit Department

The Central Glass Group established the Audit Department at the head office for the purpose of establishing internal control systems related to internal audits and financial reporting.

Operating audits are conducted as internal audits for the purpose of maintaining the effectiveness and efficiency of groupwide operations, conserving resources, and managing compliance to laws and regulations as well as to internal rules. Through these audits, the Audit Department strives to sustain appropriate and efficient business operations by providing counsel and advice about improvements when necessary.

In FY2017, they conducted operating audits based on the annual plan. When counsel or advice about improvements is given through the audit, they provide continual support until improvements are implemented.

They raise awareness about the Central Glass Group Policy Initiative each year and evaluate the effectiveness of internal control at important sites from an objective standpoint as part of its internal control system related to financial reporting for the purpose of ensuring trustworthy financial reporting.

In FY2017, they conducted assessments in line with this policy initiative and submitted an internal control report that included the effectiveness of internal control related to groupwide financial reporting as of March 31, 2018.

The Audit Department also convenes regularly and when necessary for cooperation with the Corporate Auditors. The mutual exchange of information and establishment of a cooperative framework drives the comprehensiveness and efficiency of audits.

Environment Safety Promotion Committee

The Central Glass Group has set up the Environment Safety Promotion Committee as an organization to promote groupwide Responsible Care activities in order to secure the environment, safety, and health throughout the entire life cycle from development to disposal of products based on the Responsible Care management policies.

This committee is made up of the following core members who convene in accordance with the annual plan:

- Chairperson (Executive Managing Officer in charge of the Environment, Safety and Quality Management Department)
- Vice-chairpersons (Executive Officer in charge of chemical technology and manufacturing and Executive Officer in charge of glass technology and manufacturing)
- General Managers of departments for personnel; technology; quality assurance; environment, safety, and quality management; research and development; and manufacturing.

In FY2017, the Environment Safety Promotion Committee has been raising awareness about the groupwide Responsible Care activities in FY2016 and the groupwide activity plans in FY2017 in addition to providing activity reports to each manufacturing as well as research and development department to share information, while conducting activities to foster ongoing improvements.

Anti-Monopoly Law Observance Committee

The Central Glass Group has established an Anti-Monopoly Law observance system and set up the Anti-Monopoly Law Observance Committee as an organization to promote adherence to the Anti-Monopoly Law.

This committee is made up of the following members who convene in accordance with the annual plan:

- Chairperson (Executive Officer in charge of legal affairs)
- General Managers of departments for sales, international business, purchasing, and corporate administration.

In FY2017, while primarily conducting internal education in sales departments, the Anti-Monopoly Law Observance Committee also verified whether any information was disclosed that may conflict with the Anti-Monopoly Law, examined the trends in detection of cartels and surveyed subcontracting relations. Furthermore, the committee also provided education about the prevention of cartels through outside instructors and engaged in activities to ensure observance of the Anti-Monopoly Law.

Product Safety Committee

Product safety is the top priority of the Central Glass Group. We secure the safety of products across all processes from new product development, manufacturing and distribution to sales, after-sales service and disposal. Central Glass set up the Product Safety Committee as an organization to determine swift and appropriate measures to address matters related to product liability laws.

This committee is made up of the following core members who convene when necessary:

- Chairperson (Executive Officer in charge of the Environment, Safety and Quality Management Department)
- Vice-chairperson (Executive Officer in charge of quality assurance)
- General Managers of departments for sales; technology; quality assurance; environment, safety, and quality management; and corporate administration.

The Product Safety Committee was not convened in FY2017. However, Central Glass regularly held training sessions related to product safety for committee members while conducting activities to prevent any safety issues and prepare a swift response when necessary.



FY2017 product-safety training session

Security Trade Control Committee

For the purpose of sustaining international peace and safety and preventing the stockpiling of weapons of mass destruction as well as conventional arms, the Central Glass Group exports goods and provides technology in accordance with regulations based on export and trade laws, such as the Foreign Exchange and Foreign Trade Control Act which regulates trade regarding supplying exports of cargo as well as providing technology to non-residents and to foreign countries. We act under a basic policy to never breach any laws such as the Foreign Exchange and Foreign Trade Control Act and have established the Security Trade Control Program to fully raise internal awareness about this policy. Central Glass has set up a Security Trade Control Committee to fulfill this program.

This committee is made up of the General Managers of research and development, technology, and sales, who convene in accordance with the annual plan.

In FY2017, the Security Control Committee thoroughly raised awareness about observance to laws and regulations by providing reports on the classification of exported products of the Glass Segment and Chemicals Segment, addressing major amendments to laws, regulations and policies, and informing the results of internal audits.

Furthermore, the committee conducted education mainly for sales staff, such as an overview of security export control as well as information and procedures for classifications through external lecturers, in addition to internal seminars through in-house instructors, while also engaging in activities to ensure observance of these policies.

Financial Reporting Risk Assessment Committee

The Central Glass Group evaluates and analyzes the influence of management decision-making and accounting records on financial reporting. We have set up the Financial Reporting Risk Assessment Committee to ensure the reliability of financial reporting.

This committee is made up of the following members who convene in accordance with the annual plan and when necessary:

- Chairperson (Executive Officer in charge of the Finance & Accounting Department)
- Executive Officers in charge of the corporate administration and auditing
- General Managers of departments for accounting, corporate administration, and auditing.

In FY2017, the Financial Reporting Risk Assessment Committee conducted activities which centered upon evaluation and analysis to assess and prevent potential events or manage the risk from transpired events caused by internal or external factors which may cause financial reporting risk, and presented analysis and countermeasures of events to the management committee when necessary.

Compliance Promotion Committee

The Central Glass Group drafted the Compliance Manual to promote compliance. We have also set up the Compliance Promotion Committee as an organization to assess and deliberate on matters related to compliance.

This committee is made up of the chairperson (Executive Officer in charge of the Corporate Administration Department), the General Managers of departments for corporate administration, personnel, and auditing who convene in accordance with the annual plan.

In FY2017, the Compliance Promotion Committee put in place an internal reporting system that encompasses affiliate companies, responded to internal reports, and conducted compliance promotion education.

Compliance with the Corporate Governance Code

Central Glass disseminates necessary information in accordance with each fundamental rule of the Corporate Governance Code.

We follow the intentions of the Corporate Governance Code in operating and continually reviewing fair and rapid decision-making mechanisms as we strive to realize sustainable growth and increase corporate value over the medium and long term.



Promoting Management that Fulfills Social Responsibilities

Environment and Safety Management

The Central Glass Group promotes environment and safety management with Responsible Care activities at the core to secure the environment, safety and health as well as protect the environment over the entire life cycle of our products, from the R&D stage to the procurement of raw materials, production, logistics, use, and disposal.

Environment Policy in FY2017

1. Implement energy-saving activities to prevent global warming.
2. Continue to reduce environmental burden caused by business activities.
3. Comprehend environmental laws and regulations and surely correspond to them.

Management Policy for Safety and Health in 2017

“Make efforts to maintain and enhance a safe, healthy and vibrant working environment, and achieve the Zero-accident. Safety first!”

Priority implementation items

1. Maintain workspace well-organized – Eliminate unsafe conditions –
2. Review the operation manual and thoroughly comply with it
3. Implement risk assessment and hazard prediction – Eliminate potential hazards –
4. Implement thorough prevention measures for reoccurrence of past accidents – Prevent similar accidents –
5. Enhance health management and mental healthcare
6. Enhance health maintenance by encouraging to take leave and managing appropriate working hours
7. Prevent traffic accidents not only during a commute but also in daily events
8. Further improve emergency reporting system and comply with it

Environment Safety Promotion System

The Central Glass Group emphasizes Responsible Care activities in our environment and safety management. An Environment Safety Promotion Committee has been established and the Environment, Safety, and Quality Management Department acts as the organizer under the promotion system to further the activities of the Central Glass Group. The head office, research centers and plants refine the activity plan with items unique to each business site to engage in specific environment and safety initiatives.

Environment and Safety Management Promotion System



FY2017 Targets and Performance Results

Major Issues	(P) FY2017 Targets	(D) Performance Results	(C) Ratings	(A) FY2018 Initiatives
Harmony with the environment and harmonious coexistence with society	Promote Environment Policy in FY2017.	Conducted activities based on the policies at each business site for the fiscal year in accordance with the Environment Policy in FY2017. Verified the status of initiatives with environmental safety self-audit reports and on-site environment and safety audits in addition to furthering these evaluations through management reviews at the Environment Safety Promotion Committee.	◎	Promote FY2018 Environment Policy.
Maintenance and improvement of the workplace environment	Promote Management Policy for Safety and Health in 2017.	Conducted activities based on the safety and health management policies at each business site for the fiscal year in accordance with the Management Policy for Safety and Health in 2017. Verified the status of initiatives with environmental safety self-audit reports and on-site environment and safety audits in addition to furthering these evaluations through management reviews at the Environment Safety Promotion Committee.	◎	Promote FY2018 Safety and Health Management Policy.
Promotion of environmental protection	Reduce greenhouse gas emissions by FY2020 (Target: 15% reduction relative to FY2005).	Greenhouse gas emissions (CO ₂ equivalent): 485,000 tons (Target: 49% reduction relative to FY2005)	◎	Continue activities to reduce greenhouse gas emissions by FY2020 (Target: 15% reduction relative to FY2005).
	Reduce the final disposed amount of FY2020 industrial waste (Target: 71% reduction relative to FY2000).	Final disposed amount of industrial waste: 10,000 tons (Target: 85% reduction relative to FY2000)	◎	Continue activities to reduce the final disposed amount of industrial waste (Target: 71% reduction relative to FY2000).
Promotion of security and disaster prevention	Thoroughly comply with laws and regulations and pass on safety techniques and know-how.	Conducted activities in accordance with the Security and Accident Prevention Guidelines.	◎	Thoroughly comply with laws and regulations.
	Emphasize efforts toward establishing equipment safety measures.	Verified the progress of management, such as statutory inspections, self-inspections, and operational standards.	◎	Implement equipment safety measures and ensure operational safety.
	Effectively utilize accident data.	Began operations of a security and disaster prevention database and shared accident data and recurrence prevention measures.	◎	Expand operation of the security and disaster prevention database to affiliate companies in Japan.
Promotion of industrial health and safety	Implement measures to prevent occupational accidents, utilizing information such as factor analyses of the 2016 occupational accident report.	Provided cautionary reminders to each business site taking into consideration the type and timing of incidents. Number of occupational accidents: 43	△	Implement measures to prevent occupational accidents based on the 2017 occupational accident report.
	Hold safety training sessions for the purpose of formulating clear recurrence prevention measures.	Held safety training sessions to rectify the causes of accidents through the 5 Whys Analysis techniques.	◎	Continue to hold safety training sessions for the purpose of formulating clear recurrence prevention measures.
	Maintain and continue the management system and adopt it at other business sites.	Continued to maintain OHSAS 18001 certification at the Ube Plant. Began activities to build an occupational safe and health management system (OSHMS) at the Matsusaka Plant.	◎	Maintain and continue the management system.
Promotion of logistical safety	Prepare new yellow cards and revise existing yellow cards.	Prepared yellow cards for new chemical substances and revised existing yellow cards.	◎	Prepare new yellow cards and revise existing yellow cards.
Promotion of chemical and product safety	Comply with relevant laws and regulations and successively revise SDS and GHS labeling.	Provided various notifications related to the Chemical Substances Control Law, the Act on the Evaluation of Chemical Substances, the Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof, and Industrial Safety and Health Act. Revised SDS and GHS labeling.	◎	Continue to comply with relevant laws and regulations and successively revise SDS and GHS labeling.
	Asbestos management: Completely remove and properly handle asbestos when renovating equipment.	Properly removed equipment that uses materials containing asbestos. Disposed of asbestos at the Ube Plant and some affiliate companies.	◎	Continue to completely remove and properly handle asbestos when renovating equipment.
	PCB management: Strictly manage machinery containing PCBs and conduct disposal according to local administrative guidance.	Properly managed and disposed of PCBs at business sites that have machinery containing PCBs. Disposed of PCBs at the Ube Plant, Matsusaka Plant, Matsusaka Plant Sakai Manufacturing Site, and some affiliate companies.	◎	Continue to strictly manage machinery containing PCBs and dispose of PCBs according to local administrative guidance.

Rating: ◎: Achieved target △: Achieved most targets but not all ×: Additional measures required

*The period for data collected about health and safety was from January to December 2017

Quality management

The Central Glass Group formulates annual quality policies based on the Basic Quality Policy and in consideration of quality assessment results for the previous fiscal year. These annual policies are rolled out at each business site and affiliates in Japan and abroad. Each business site strives to make continuous quality improvements in order to achieve quality objectives based on the quality policies. We check and assess conformity with requirements as well as the effectiveness of our Quality Management System (QMS), manufacturing processes, and products through quality audits and reviews of quality improvement initiatives, tying the results into activities aimed at improving quality.

Basic Quality Policy

Central Glass aspires to truly contribute to society with the environment, safety, and quality as our fundamental principles. We always place customer satisfaction first and provide reliable products and services that customers love and can use with peace of mind throughout the entire product lifecycle, from product development to disposal after use.

Action Guidelines

1. Listen to customers and respond promptly.
2. Build quality through our processes and continually improve our products.
3. Provide customers with appropriate information regarding the quality and features of our products.

Quality Policy in 2017

1. Develop quality management system

Work on developing more effective quality management system with conscious of that “Quality must be built in during the manufacturing processes.” and “The next processes are our customers.” in all processes.

2. Continue and strengthen risk reduction activities

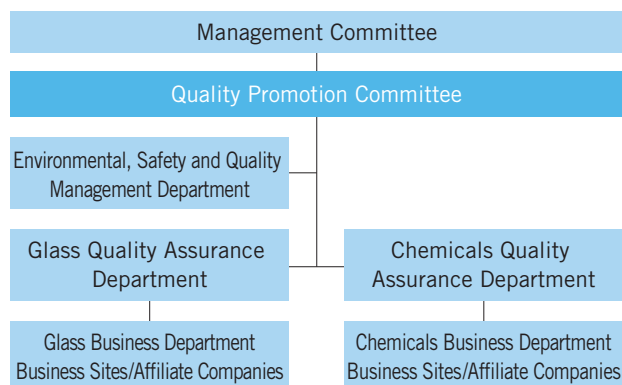
Predict potential risks and work on reducing them in all processes.

3. Ensure strict compliance

Ensure strict compliance in all processes, “Follow what are decided.” and “Follow what we decide.”

Quality Management Promotion System

The Central Glass Group provides products that satisfy customers based on our management policy in addition to regularly convening a Quality Promotion Committee and promoting quality assurance activities throughout the whole Group in order to continually improve all processes. We conduct quality assurance activities through an organizational structure that allows us to take practical action on quality assurance by separating the quality assurance department into corporate administration, glass and chemicals business operations for the purpose of enhancing the functionality of quality assurance systems suited to the glass and chemicals segments.



FY2017 Targets and Performance Results

Major Issues	(P) FY2017 Targets	(D) Performance Results	(C) Ratings	(A) FY2018 Initiatives
Improvement of customer satisfaction	Improve Quality Management System	<ul style="list-style-type: none"> Maintained the Quality Management System and conducted improvement activities through efforts that include quality audits of each business site and affiliate company. Promoted quality management activities through quality audits of subcontractors and suppliers of raw materials. 	◎	Verify and continually improve the effectiveness of quality management in all processes.
	Continue and enhance risk-reduction initiatives.	<ul style="list-style-type: none"> Conducted activities to prevent and reduce complaints at each business site as well as manufacturing sites of affiliate companies. Conducted quality and product-safety education through rank-based and department training. 	◎	Determine causes of nonconformities, thoroughly prevent recurrence, and work to prevent nonconformities in all processes.
	Ensure compliance	<ul style="list-style-type: none"> Conducted product safety training sessions that included education about laws and regulations related to quality and product accidents, the Product Liability Act (PL Act) and the Consumer Product Safety Act. Held a meeting to establish measures against serious quality issues due to becoming aware of improper installation of products certified by the Ministry of Land, Infrastructure, Transport and Tourism. Implemented proper measures in accordance with approved proposals. 	△	Ensure strict compliance. “Follow what is decided” and “Follow what we decide.” Recognize the impact of improper actions on quality and engage in fair and reliable quality activities.

Rating: ◎: Achieved target △: Achieved most targets but not all ×: Additional measures required



Promotion of Responsible Care Activities

The Central Glass Group will strive to enrich society through measures that ensure the protection of the global environment and the health and safety of people through Responsible Care activities.

Environment and Safety Audits

The Central Glass Group verifies the level of compliance with laws and regulations related to occupational health and safety as well as to the environment in addition to confirming the state of the environment, safety and health in manufacturing, usage, logistics, disposal and recycling processes of chemical substances at our plants, research centers and affiliate companies in Japan.

To verify the status of each item, each business site conducts an environmental safety self-audit, followed by an on-site environment and safety audit by an audit team that includes the chairperson of the Environment Safety Promotion Committee to directly verify the level of management.

In FY2017, we conducted environmental safety self-audits at 51 business sites in Japan encompassing the Central Glass Group as well as executed on-site environment and safety audits at 16 of those business sites. If improvements or corrective actions were requested during these audits, we provided support until those improvements or corrective actions were implemented. The Central Glass Group also confirmed the level of environment and safety activities at six business sites overseas.

We will continue to strive to improve the level of statutory compliance and activities for the environment and safety at each business site worldwide.

Promotion of environmental protection

The Flow of Substances at the Central Glass Group

The Central Glass Group quantitatively tracks the environmental impact of manufacturing processes in order to identify environmental issues and implement measures for making improvements as we constantly strive to reduce the burden on the environment. The glass segment and chemicals segment each have a large focus on making sustained efforts toward energy saving activities and the establishment of recycling systems. In the glass segment, establishing measures to prevent global warming is a priority, since daily operations require a huge amount of heat energy to melt raw materials. On the other hand, the chemicals segment engages in the development of environmentally friendly products and reduction of waste.

INPUT

Total amount of materials input		Amount of water resources input		Amount of net energy input	
Central Glass	Affiliate Companies	Central Glass	Affiliate Companies	Central Glass	Affiliate Companies
1,029,000 tons		19,096 million m ³		15,386 TJ*	
696,000 tons	333,000 tons	11.026 million m ³	8.070 million m ³	8,235 TJ	7,151 TJ

* TJ (terajoules) is a unit for energy (joules). One terajoule is equal to one trillion joules.



OUTPUT

Atmosphere		Water		Waste	
Emissions of greenhouse gases		Net amount of discharged water		Net emissions of waste	
Central Glass	Affiliate Companies	Central Glass	Affiliate Companies	Central Glass	Affiliate Companies
827,000 tons-CO ₂		17,338 million m ³		104,000 tons	
518,000 tons-CO ₂	309,000 tons-CO ₂	10.408 million m ³	6.930 million m ³	46,000 tons	58,000 tons
Emissions of substances that damage the atmosphere		Emissions of substances that affect water quality		Final disposed amount of waste	
Central Glass	Affiliate Companies	Central Glass	Affiliate Companies	Central Glass	Affiliate Companies
4,506 tons		137 tons		24,000 tons	
3,439 tons	1,067 tons	98 tons	39 tons	10,000 tons	14,000 tons

Reporting range

- Central Glass... Three plants, one manufacturing site, three research centers, and the head office
 - Domestic affiliates... Six major affiliates
 - Overseas affiliates... 11 major affiliates
- Tabulation of emissions of environmental impact substances at overseas affiliates began in FY2013. Some business sites for which calculations were unavailable are excluded.

Recycling rate for waste 85%

Central Glass	Affiliate Companies
77%	88%

Reduction of Greenhouse Gas Emissions

Central Glass has set and is working toward a FY2020 target of reducing greenhouse gases that are given off by the use of fuel, purchased power, and raw materials for manufacturing by 15% relative to FY2005 levels with this serving as a mid-term initiative to prevent global warming.

Our greenhouse gas emissions due to plant operations in FY2017 were 485,000 tons (CO₂ equivalent, 49% reduction relative to FY2005). In addition, we strove to reduce the amount of greenhouse gas emissions due to transport of products, such as increasing modal shifts toward railway and sea vessels in FY2017. However, the amount of greenhouse gas emissions increased relative to the previous year due to an increase in the average distance of transport caused by a reduction in short-distance transport services.

We will continue to strive to reduce the amount of greenhouse gas emissions including overseas affiliates.

Reduce the final disposed amount of industrial waste

●Central Glass:

Central Glass's plants support promotion of reduction, reuse, and recycling of industrial waste as an important task in our Responsible Care activities, and each business site carries out initiatives accordingly.

We had been working toward the target of a 65% reduction in industrial waste (final disposal volume) from the FY2000 level by FY2015. We met this initial target, and ultimately achieved a reduction of 74% in FY2015 from the FY2000 level. From FY2016 onward, we have set a target of a 71% reduction from FY2000, based on targets set by the Japan Chemical Industry Association and the Flat Glass Manufacturers Association of Japan according to guidelines established by the Japan Business Federation. We aim to achieve this target by FY2020.

In FY2017, our industrial waste (final disposal volume) amounted to approximately 10,000 tons, down 85% from FY2000. Thus, we continued to achieve our target. We will continue management efforts to sustain our target achievement for FY2020.

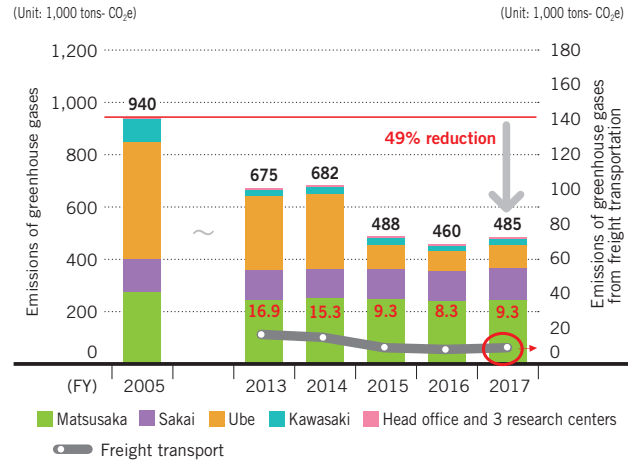
(Government target: 70% reduction in the final disposed amount of industrial waste in FY2020 compared to FY2000)

●The Central Glass Group:

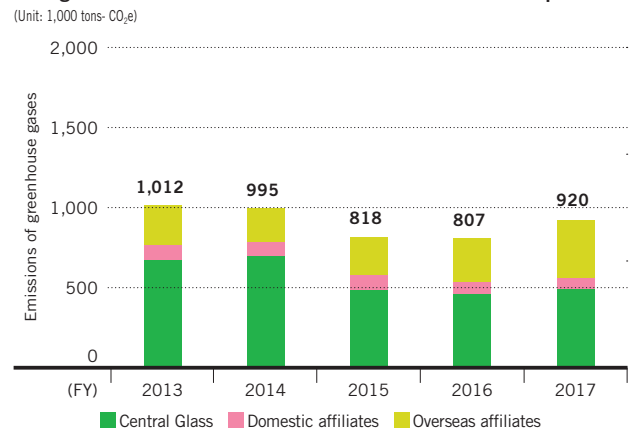
The Central Glass Group has shown an overall reduction in waste by implementing unique reduction measures at each business site, but the amount of waste increased at our overseas affiliates in FY2017 due to the impact of periodic repairs to float glass manufacturing lines.

We will continue to work to reduce waste.

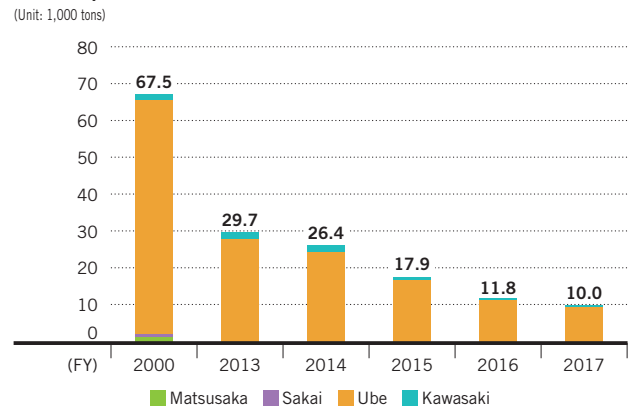
Changes in Greenhouse Gas Emissions (Central Glass)



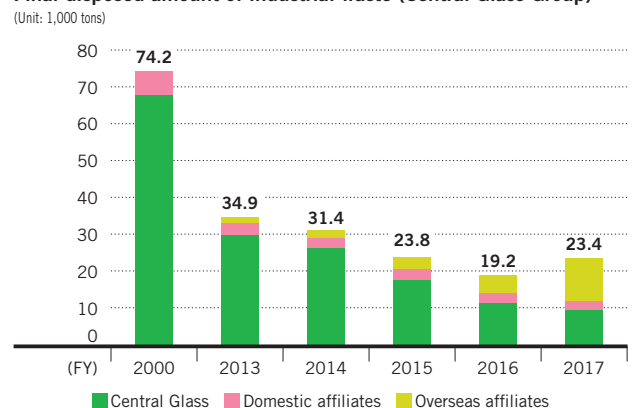
Changes in Greenhouse Gas Emissions (Central Glass Group)



Final disposed amount of industrial waste (Central Glass)



Final disposed amount of industrial waste (Central Glass Group)



Reducing Environmentally Hazardous Substances

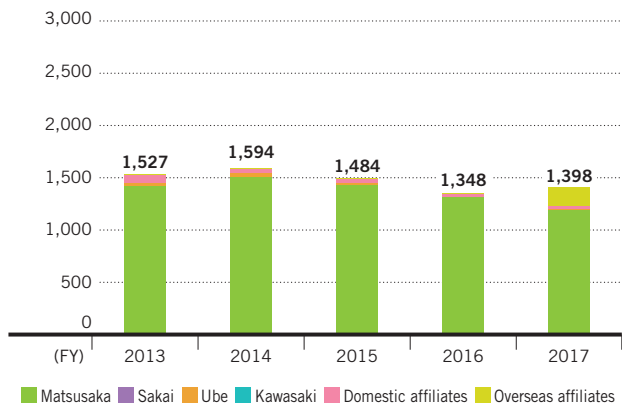
The Central Glass Group's manufacturing sites are operated in compliance with emission standards for atmosphere, water quality, and other environmental indicators in the regions where they are located. Reducing environmentally hazardous substances is an important challenge in regards to the global environment and human health and safety, therefore we will continue to carry out appropriate management.

Countermeasures Against Chemical Substances that Damage the Atmosphere

The trends in our emissions of three chemical substances that damage the atmosphere, sulfur oxide (SOx), nitrogen oxide (NOx), and ash dust, are shown below.

SOx emissions

(Unit: tons)

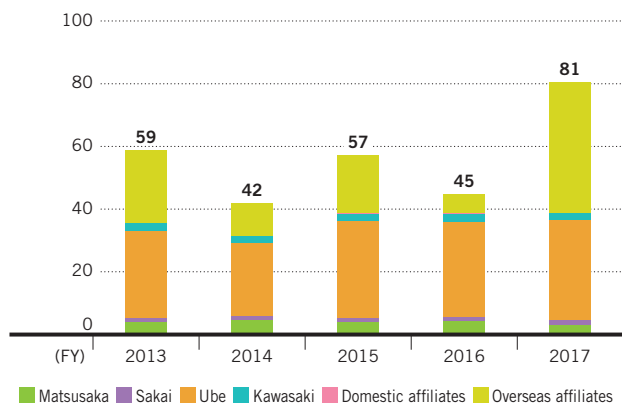


Countermeasures Against Pollutants that Impact Water Quality

Among controlled substances that impact water quality, trends in our chemical oxygen demand (COD) and emissions of phosphorous and nitrogen are shown below.

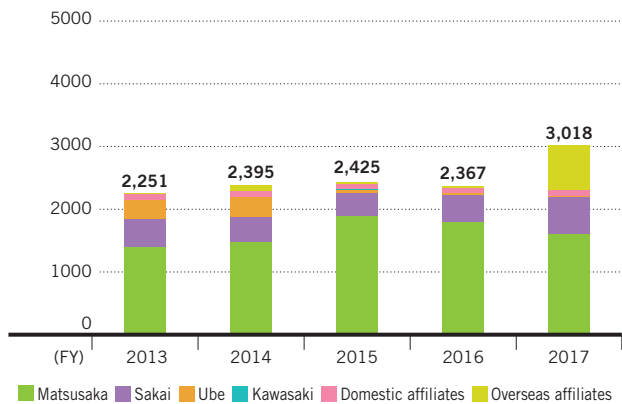
Chemical oxygen demand (COD)

(Unit: tons)



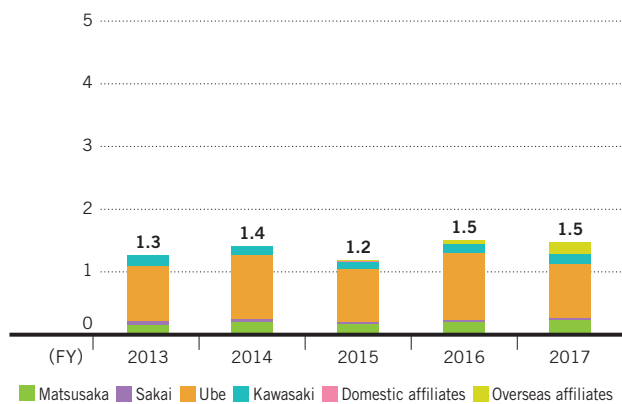
NOx emissions

(Unit: tons)



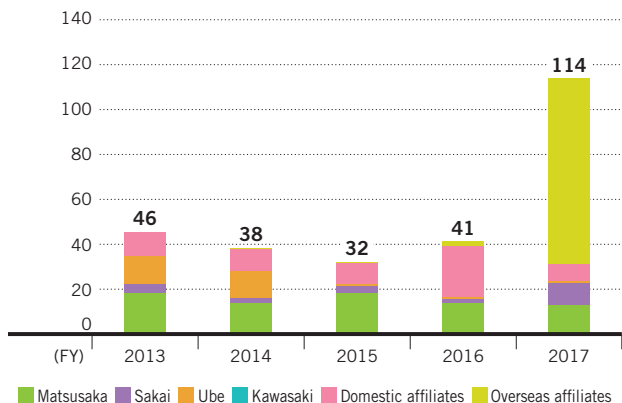
Total phosphorous emissions

(Unit: tons)



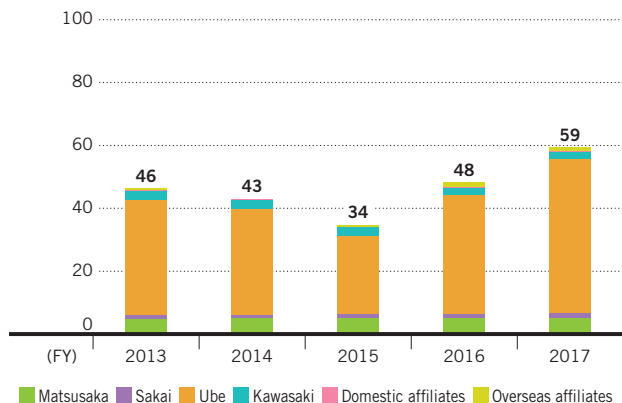
Ash dust emissions

(Unit: tons)



Total nitrogen emissions

(Unit: tons)



*The data for overseas affiliates are shown as reference because the data was collected according to the standards in each region.

Reduction of Chlorofluorocarbon Emissions from Industrial Air-conditioning Equipment and Refrigerators

Central Glass calculates the amount of chlorofluorocarbon emissions based on the Act on Rational Use and Proper Management of Fluorocarbons (enacted in 2015). As a result of simplified checks and regular inspections of all 3,032 units at our business sites in FY2017, we discovered a total of 2,115 tons of CO₂ emissions. Central Glass notified to the government in accordance with the Act on Rational Use and Proper Management of Fluorocarbons because the CO₂ emissions exceeded 1,000 tons.

In the future, we will strive to reduce emissions of chlorofluorocarbons through measures that include identification and repair of leakage areas, equipment management, and the control of the amount of refrigerants.

Promotion of Security and Disaster Prevention

Because most of Central Glass’s major plants are located in areas designated by the Act on the Prevention of Disaster in Petroleum Industrial Complexes and Other Petroleum Facilities, each plant has established a full-scale security and disaster prevention system under the guidance of the authorities concerned with the environment, security, and disaster prevention, as we aim to completely eliminate facility disasters. Central Glass reports any incident such as fire or leakage that occurs in a plant to fire departments and government agencies as an irregular incident.

We work to preemptively prevent accidents and disasters through efforts such as activities that are based on the Security and Accident Prevention Guidelines compiled by the Japan Chemical Industry Association (JCIA) at each plant and through the passing down of know-how to our young employees.

Furthermore, the relevant parties conduct safety inspections of facilities after installing, expanding, renovating, or updating equipment, before operations begin, in order to preemptively prevent any accidents or disasters.

Promotion of Industrial Health and Safety

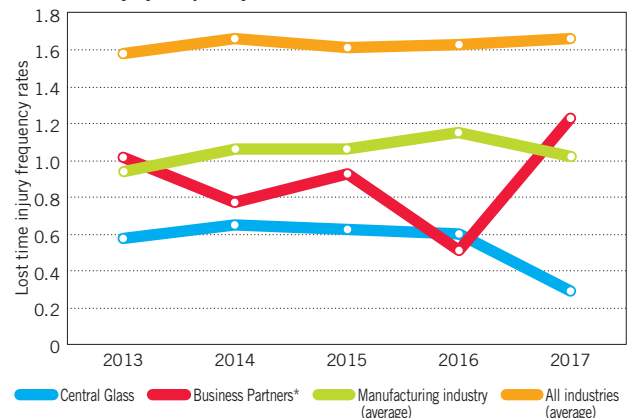
The Central Glass Group has defined our priority implementation items and engages in activities at each business site under the principle to “Make efforts to maintain and enhance a safe, healthy and vibrant working environment, and achieve the Zero-accident. Safety first!” outlined in the Management Policy for Safety and Health. Moreover, we are raising awareness about occupational health and safety through the Summertime Industrial Accident Prevention Campaign and Heatstroke Prevention as well as through holding the Safe Operation Awards.

In FY2017, there were 43 incidents in total, of which 11 cases resulted in lost work hours and 32 cases did not result in lost time. The number of incidents increased by four compared to the previous year.

Central Glass continued to show a downward trend in the lost time injury frequency rates, but the rates at business partners including domestic affiliates were higher than the average frequency rate in the manufacturing industry.

We will continue to work to heighten awareness about occupational health and safety in the future.

Lost time injury frequency rates



Lost time injury frequency rates = (Number of deaths or injuries by accident / Total work hours) x 1,000,000
 (The frequency rate of accidents that result in lost work hours per million working hours)

(*Business Partners: Affiliate companies and subcontractors)

Promotion of Logistical Safety

Central Glass and our domestic affiliate companies implement periodic training and education for not only their employees but also for employees at the business partners to which they outsource transporting in order to prevent accidents during the transportation of chemical substances and to minimize the damage in case of incidents.

When chemical substances are transported by road, we prepare emergency contact cards (yellow cards) for drivers, which they carry not only when obligated by law, such as during the transportation of high-pressure gases and poisonous substances, but also when transporting other chemical substances, in accordance with the “Guidelines for Logistical Safety Management” that we have formulated. The cards show measures to be taken to minimize damage and details to be reported so that the transporter, firefighters or police officers can respond appropriately and promptly should an accident occur during transportation by road. The details listed on these cards are periodically revised by the relevant departments.

Promotion of Chemical and Product Safety

The regulations on chemical substances around the world have grown more sophisticated, moving from traditional hazard management to risk management that takes into account exposure factors. The intention is to achieve the goal of the accord of the 2002 World Summit on Sustainable Development in Johannesburg, "Aiming to achieve, by 2020, the use and production of chemicals in ways that minimize significant adverse effects on human health and the environment." Such regulations include Europe's REACH regulations and Japan's revised Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc. Furthermore, revisions to laws on chemical substances have been pushed forward in Asian countries in recent years, and we must continue to properly comply with them. Following this trend, the Central Glass Group is working to ensure safety through a variety of different initiatives at every stage in which chemical substances are handled.

Management of Chemical Substances

Central Glass has been voluntarily surveying, aggregating, and reporting PRTR^{*1} data since FY1995, prior to the enactment of the Chemical Substances Management Act (2000), in order to reduce emissions of chemical substances into the environment. The number of substances subject to notification in FY2017 at Central Glass and our domestic affiliates decreased by one to 59 compared to the previous fiscal year (status of each Central Glass plant is given in "Activities of Individual Plants" on pages 32 to 35).

We will continue to comply with laws and regulations including the Industrial Safety and Health Act, the Poisonous and Deleterious Substances Control Act, and the High Pressure Gas Safety Act in order to further improve measures ensuring the safety and health of workers. Our affiliate companies, both in Japan and overseas, get a grasp of local laws and the chemical substances they handle in order to promote the management of chemical substances from a global perspective. We will continue working to properly manage chemical substances.

*1 PRTR: Pollutant Release and Transfer Register

Asbestos Management

Structural components containing asbestos are still used in some of the buildings and production facilities at Central Glass and our domestic affiliate companies. We therefore identify the locations where those components are used, and complying with the Industrial Safety and Health Act, Wastes Disposal and Public Cleansing Act, etc., manage them appropriately and properly dispose of them upon removal.

In order to ensure appropriate handling, we conduct an on-site environment and safety audit once a year as an opportunity to survey the state of use, storage and disposal of asbestos at Central Glass and our domestic affiliates and confirm the level of asbestos use and storage.

In FY2017, we disposed of asbestos used in materials such as the thermal insulation of piping at production facilities at the Ube Plant and some affiliates.

Moving forward, we will continue to comply with laws and ordinances and promote appropriate measures.

Management of Instruments Containing PCB

Central Glass and our affiliates ensure instruments such as transformers, stabilizers, and capacitors that contain polychlorinated biphenyl (PCB) comply with the Act on Special Measures Concerning Promotion of Proper Treatment of PCB Waste, Wastes Disposal and Public Cleansing Act, and other

laws and regulations. We dispose of PCBs through strict management, following the set schedule of disposal.

In order to ensure appropriate handling, we conduct on-site environment and safety audits each quarter as an opportunity to survey the state of storage and disposal of instruments containing PCB at Central Glass and our domestic affiliates and to confirm the level of management.

In FY2017 we disposed of PCBs at the Kawasaki Plant, Matsusaka Plant, Matsusaka Plant Sakai Manufacturing Site and some affiliate companies.

Moving forward, we will continue to comply with laws and ordinances and promote appropriate measures.

SDS/GHS Labeling

Central Glass and our domestic affiliates strive to provide information through SDS^{*1} that conform to GHS^{*2}. When handling chemical substances, measures necessary for risk abatement can be taken based on the information listed in the SDS, which leads to protecting safety and the environment.

We continued to strive for comprehensive safety management by raising employee awareness about SDS in FY2017, such as the SDS of products and purchased raw materials. We also take the same care in the labeling for containers and packaging in accordance with the GHS. We fully comply with amendments of the Industrial Safety and Health Act, including those executed in June 2016, which covers the addition of chemical substances, by informing departments responsible for creating labels and issuing labels after mutual confirmation among multiple departments.

These SDS and labels are included in our company database that is used to share safety information.

*1 SDS: Safety Data Sheet. These are data sheets that list information related to the hazardousness of chemical substances and the like as well as information concerning the environment.

*2 GHS: Globally Harmonized System of Classification and Labelling of Chemicals. This globally harmonized system classifies and labels chemical products.

Promotion of Green Procurement

Central Glass actively promotes green procurement to give priority to procuring raw materials and materials that have less impact on the environment.

In FY2017, we formulated company rules, and reviewed and revised relevant regulations and standards in order to run with clearer operations for green procurement.

Through these initiatives, we will promote the reliable management of chemical substances.



To Provide Reliable Products and Services to Our Customers

The Central Glass Group carries out quality control initiatives that always place customer satisfaction first as we work toward our goal of establishing a truly prosperous society through the spirit of *Monozukuri*. In addition to complying with laws and regulations, we ensure product safety in order to minimize risks to customers, and take customer feedback seriously so that we can accurately understand their demands and provide reliable products and services.

Quality Control Audits

Central Glass systematically conducts quality control audits at each business site as well as at affiliates in Japan and overseas through each quality assurance department in the glass and chemical segments.

In FY2017, we conducted audits at 19 sites based on the annual plan. If improvements or corrective actions were requested during these audits, we provided support until those improvements or corrective actions were implemented. We will continue to strive to improve the level of activities at each site.

35th Group-wide QC Circle Conference

The Central Glass Group regularly holds groupwide QC Circle Conferences as a venue to present the success of quality improvement activities.

A total of ten teams (“Circles”) gave presentations at the 35th conference held in FY2017, consisting of five Circles from the manufacturing divisions, one from the technology division, three from affiliates in Japan, and one from an overseas affiliate.

Each Circle presented improvement activities from various perspectives as well as the outcome of their efforts over the past year. There were also lively question and answer sessions among presenters, judges, and attendees.

As our QC Circles engage in friendly competition with each other through these groupwide conferences, they pursue the realization of the Central Glass Group’s corporate philosophy, “Creating a better future through *Monozukuri*.”

Circles Participating in the 35th groupwide QC Circle Conference (In order of presentation)

Business Site	Circle Name
Mie Glass Industry Co., Ltd.	Checkers
Sakai Manufacturing Site Matsusaka Plant	Bomber
Glass Manufacturing Technology Center	Architect M-power
Carlex Glass America, LLC Vonore Plant	QSB Team
Central Glass Fiber Co., Ltd. Matsusaka Plant	CSMC
Kawasaki Plant	Renewal
Kawasaki Plant	Rewrite
Central Chemical Co., Ltd. Ube Plant	Yayoi Group
Ube Plant	Clean
Ube Plant	Refresh



Presentation by Carlex Glass America, LLC



Awards Ceremony

Quality and Product-Safety Education

In order to conduct comprehensive and systematic quality related education, we established a quality education system for Central Glass and our affiliates in Japan in FY2016, and began providing employees with systematic education organized by position and division to enhance understanding of laws and regulations, knowledge, management methods relating to quality, and raise quality awareness.

We continued to conduct various education programs according to the annual plan in FY2017. Through rank-based training, we implemented product safety education to the Product Safety Committee in addition to teaching laws, regulations and management methods relating to quality to newly appointed managers and assistant managers. Through department training, we instructed the sales divisions on quality and product safety, and the research and manufacturing divisions on creating SDS and GHS labeling.

We utilized knowledge and techniques gained through these educational opportunities in promoting quality activities that put customer satisfaction first.



Training for newly appointed managers (quality education)



Training regarding SDS and GHS labeling
(Research division: Chemical Research Center)

Supplier Initiatives

Original Equipment Manufacturing (OEM) Audits

Each quality assurance department of the glass and chemicals segments of Central Glass conducts audits at our OEMs as well as regular audits within the Group.

In FY2017, based on the annual plan, we conducted audits at 10 OEMs with their understanding and cooperation. If improvements or corrective actions were requested during these audits, we provided support until those improvements or corrective actions were implemented.

We will always engage in activities to provide reliable Central Glass products and services.

Conflict Mineral Surveys

Central Glass purchases materials from smelting companies certified through the Responsible Minerals Initiative (RMI) in accordance with the Reform and Consumer Protection Act (Section 1502) adopted in the United States for the procurement of conflict minerals (tantalum, tin, tungsten, and gold).

In FY2017, we verified whether any of our procurement partners were handling conflict minerals and ensured materials were procured from smelting companies certified under the RMI thanks to the understanding and cooperation with our business partners.

We will continue to implement these activities to provide reliable Central Glass products and services.

*Central Glass has become aware that installations of certain Super Firelex glass products, which are a specific fire prevention apparatus (fireproof door) certified by the Ministry of Land Infrastructure and Transport relating to a construction method in accordance with the Building Standards Act, were installed with specifications that differ from those certified by the Ministry. This inconsistency has already been fully explained and rectified with all of the owners according to instructions from the Ministry of Land Infrastructure and Transport. Central Glass has completed confirmation to ensure the effectiveness of measures to prevent subsequent inconsistencies through a quality audit of the OEM responsible for the error. In addition, we have conducted tests to verify the safety performance of the actual products that had been delivered via a designated performance appraisal institution and confirmed there were no safety issues.

*Central Glass has become aware of an issue in which one of our outsourced manufacturing companies shipped some tempered glass and heat-resistant tempered glass products used in the apertures of buildings that did not undergo the heat soaking process (the "Products Concerned"), that should have been carried out as part of our internal specifications. We have already individually reported to our business partners who received the Products Concerned and have taken steps to resolve the situation. We are making exhaustive efforts to prevent a recurrence of the incident by investigating the cause and implementing further measures.

Heat soaking: The heat soaking process is a process that carries out a reheating treatment after manufacturing of the tempered glass and heat-resistant tempered glass products so that unremovable foreign particles are forcibly expanded, destroying the glass in the process. This process reduces the risk of later potential spontaneous breakage caused by unremovable foreign particles.



Manufacturing (*Monozukuri*) Is about Developing Human Resources (*Hitozukuri*)

Central Glass is a “*Monozukuri*” (manufacturing) company that has continually provided superior products with higher added value in order to enrich people’s lives. We focus on *Hitozukuri* (developing human resources) as the foundation of our corporate growth and strive to enhance our human resource development and HR programs with the aim of creating an environment where each individual can demonstrate his or her capabilities and skills to the utmost.

Creating a Healthy and Vibrant Corporate Culture

First Action Plan to Promote Female Workplace Participation

- Target 1** Establish a target percentage for female hires in recruitment (quantitative target).
- Target 2** Reconsider working styles.
 1. Change from “overtime as the norm” to “overtime as something extra”
 2. Create an environment where taking paid leave is the “norm”
- Target 3** Conduct an awareness/environmental survey.

With the formulation of our Action Plan to Promote Female Workplace Participation, we are striving to reform working styles and change awareness by making the most of the diverse human resources represented by our employees, providing effective education, reforming our working environments, and increasing productivity, in order to foster a healthy and vibrant corporate culture that allows all employees to succeed.

Our goal is to become a company where each and every employee can feel themselves grow and gain motivation to work over the long term.

First Action Plan to Promote Female Workplace Participation and Performance Results

Major Issues	(P) FY2017 Action Plans	(D) Performance Results	(C) Ratings	(A) FY2018 Initiatives
Reconsider and raise awareness about working styles	Establish a target percentage for female hires in recruitment. (Double the average over the last five years)	● Succeeded in doubling the average over the last five years, including the first recruitment of women at sites employing a three-shift system.	◎	Actively recruit women and establish a comfortable work environment for employees with diverse backgrounds.
	Reconsider working styles. 1. Change from “overtime as the norm” to “overtime as something extra” 2. Create an environment where taking paid leave is the “norm”	1. Succeeded in reducing annual overtime by 5.1 hours per person relative to the previous year by establishing specified days to leave work on time twice a month (“Smart Day”). 2. Succeeded in increasing annual leave taken by 1.2 days per person relative to the previous year by introducing a planned leave program to encourage employees to take at least one day of paid leave per month.	◎	Raise awareness about efficient working styles and encourage change in managers’ attitudes about time management.
	Conduct an awareness/environmental survey.	● Conducted surveys on subjects such as the workplace environment for both raising children and caring for family members, as well as about the desire to work.	◎	Heighten awareness of relevant regulations, policies, and specific examples.

Rating: ◎: Achieved target △: Achieved most targets but not all ×: Additional measures required

Employment and Development of Diverse Human Resources

Central Glass works to employ and develop diverse human resources while furthering the development of a company culture where each and every employee can work enthusiastically.

We strive to put in place policies to support people raising children and caring for family (see “Initiatives to Support Work and Family Life Balance” on page 27), to globalize, and to hire a multinational workforce to take advantage of experiences from various cultures and values. As of the end of FY2017, our employment rate of persons with disabilities was 2.41%, higher than the 2.0% employment rate mandated by law in FY2017. Central Glass is committed to continually advance our employment of persons with disabilities and to creating accommodating environments where they can exercise their diverse abilities.

Employment status data

Item	FY2015	FY2016	FY2017
Number of employees	1,645	1,662	1,666
Number of new recruits	64	83	75
Average age	36.4 years old	36.2 years old	36.3 years old
Average years of continuous employment	14.7	14.5	14.8
Number of non-Japanese employees	5	5	6
Number of employees on shortened or staggered working hours during child care	16	20	30
Percentage of persons with disabilities	2.20%	2.21%	2.41%

Initiatives to Support Work and Family Life Balance

We are building systems to support people who are raising children or caring for family members, that surpass those mandated by law. In FY2017, Central Glass began offering half-day leave for preparing for child birth, raising children, caring for a sick family member, or for nursing care. Female employees using the childbirth and parental leave programs have become a norm in the company culture, and male employees are also taking advantage of programs that include childbirth, child care and nursing care leave. Furthermore, female and male employee usage of child care leave and staggered working hours while raising children is increasing.

We are also developing systems for nursing care programs by eliminating the concerns of employees caring for family members through informing and publicizing model cases that include clear usage procedures of the systems, so that they can balance work and care for their family members when necessary.

Child care and Nursing Care Programs

Childbirth preparation leave*	Two days off per month for hospital visits, etc. during pregnancy.
Maternity leave	Legally mandated leave before and after childbirth.
Childbirth leave	Three days off within a one-month period around the expected delivery date.
Child care leave	Legally mandated child care leave. Child care leave is available to employees with children between the ages of one year and six months to two years old. Up to five days of paid leave from the first day of leave.*
Parental leave*	One day off per month for child care.
Nursing care leave for children	36 days off per year for nursing care for children.*
Shortened working hours during child care*	Shortening of working hours by a maximum of two hours per day.
Staggered working hours during child care	One-hour postponement of the start of the workday for staggered working hours during child care.
Nursing care leave*	Total of 365 days of leave, which can be divided into up to three periods.
Time off for nursing care	Ten days off per year for nursing care and to attend to family members.*
Shortened working hours for nursing care	Shortening of working hours by one hour per day.

An asterisk indicates a program surpassing that mandated by law (the program itself, the length of time, etc.)



Yukihide Nishi Central Glass Plant Services Co., Ltd.

My wife and I work while we take care of our three sons who are two, five and seven years old. I applied for staggered working hours to take care of my children from May of 2017 as my wife was returning to work after finishing her child care leave.

The program for staggered working hours during child care has let me postpone the start of my workday by one hour. This system helped deepen the bond between my family because I could cooperate with my wife in raising our children, such as seeing off my oldest son to elementary school, dropping off and picking up my other sons from kindergarten, and doing housework.

This experience has given me a chance to reflect on efficiently using my time to balance raising my children and doing housework, and I will utilize this experience in time management at work.



Applicable periods for child care support system (from pregnancy to child-raising)

Pregnancy	6 weeks	8 weeks	After 1 year	1 year and 6 months	After 2 years	Before elementary school enrollment	First grade	Elementary school graduation
Childbirth preparation leave		Delivery date						
	Maternity leave							
	Childbirth leave (3 days)							
		Child care leave		(can be extended until the child is one year and six months or until two years old)				
					Parental leave			
					Staggered working hours during child care			
					Shortened working hours during child care			
								Nursing care leave for children

*Only female employees are eligible for maternity leave, and only male employees are eligible for childbirth leave; all other measures are open to both male and female employees.

Mental Healthcare

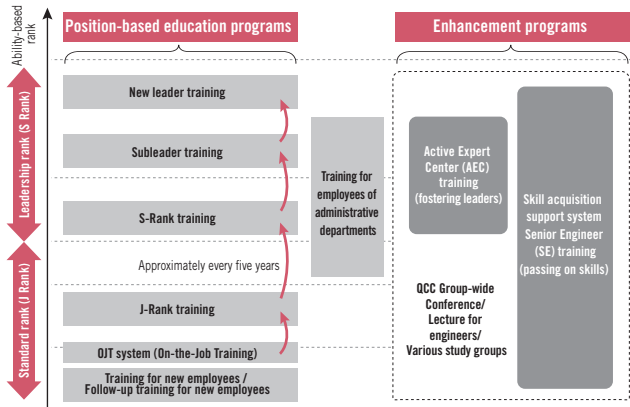
In recent years, the challenge of mental health issues faced by companies has become a social problem. Individuals who suffer from mental disorders hurt both the atmosphere and productivity of the workplace. Companies have an obligation to consider safety of employees. The scope of this duty not only includes the prevention of injuries and accidents, but also the monitoring of mental health, and a more sophisticated and prudent approach is needed.

The Central Glass Group has been encouraging every employee to assess their level of stress by introducing annual stress checks since FY2009 as a primary step to prevent mental disorders. Our policy is to have employees who have shown a high level of stress consult with an industrial physician, and then examine aspects such as the workplace environment. We have also put in place a Return to Work Support Program to support people on leave due to mental health issues in cooperation with industrial physicians, prevent recurrence of the condition after their return to work, and achieve a smooth transition back into professional life.

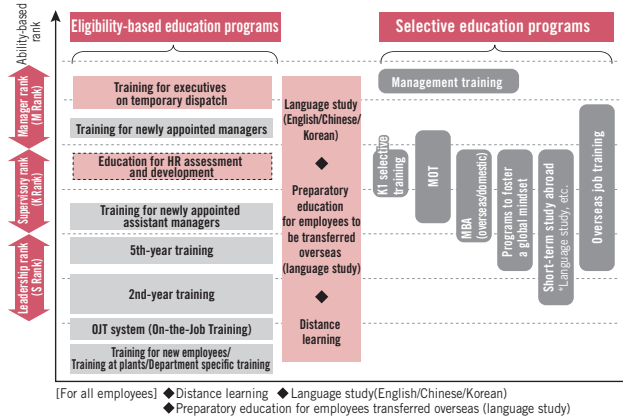
Central Glass's Education System

The education that Central Glass provides to employees has two pillars: education for career development to foster global human resources and candidates for managerial positions, and education about *Monozukuri* to pass on and develop advanced techniques and skills. In both cases, we offer a wide range of educational opportunities including position-based education programs organized according to the participants' ages and positions, as well as selective education programs organized according to work duties and abilities.

Monozukuri education



Education for career development



Training for Selected AEC Trainees

Central Glass has been conducting education for selected trainees at our Active Expert Centers (AECs), aiming to foster new generations of technical leaders at our plants. The AECs established at each plant are educational centers dedicated to passing on and developing technical skills. Each year, candidates for the next generation of leaders are selected from our manufacturing plants and leave their posts for one year of education as AEC trainees.

The trainees receive three months of fundamental education before being assigned a theme by the plant and carrying out information gathering, analysis and discussion repeatedly while visiting the production areas. This practical education effort works to solve problems in the manufacturing areas while investigating the root causes.

The training for selected AEC trainees has accepted 136 candidates since it began in FY2006. By continually educating employees as trainees and sending them back to their departments, we are building a culture able to augment improvement activities with excellent teamwork and an increased base level performance.

Number of trainees by fiscal year

Fiscal year	Number of trainees
2013	11
2014	10
2015	11
2016	9
2017	10

Study Abroad Programs

Central Glass has established MBA and MOT programs to send employees to graduate schools worldwide for two years, aiming to cultivate future management candidates. The goal of the MBA program is to encourage the development of employees with high levels of management skills through systematically learning specialized knowledge about management. On the other hand, the goal of the MOT program is to encourage the development of employees who can advance strategic research and technological management through extensive study of technology and management.

In addition, the short-term study abroad program sends employees to foreign language schools for three to six months in order to foster practical abilities and international awareness through language study.

Number of participants in each program

Fiscal year	MBA/MOT	Short-term study abroad
2013	4	2 (Canada: 1, India: 1)
2014	2	2 (Canada: 1, China: 1)
2015	4	2 (USA: 2)
2016	4	3 (USA: 2, China: 1)
2017	2	2 (USA: 1, China: 1)

I joined a short-term study abroad program in Beijing, China for approximately six months. I attended university from eight in the morning until noon on weekdays to primarily study pronunciation and basic Chinese grammar as well as learn about the cultures and values of various countries through my interactions with classmates. I took private lessons from two to four in the afternoon before practicing and studying at a library or a café until ten at night, and then I would watch Chinese television shows before going to bed. I immersed myself like this in the Chinese language every day. I also found a Chinese language partner who would teach me Chinese in exchange for Japanese lessons as a way to increase my exposure to native Chinese.

After my short-term study, I was assigned to work in Qingdao, Shandong, where our joint venture with Saint-Gobain is located, and I now work together with my local colleagues while using Chinese. I continue to study because I still get confused at times by things like proverbs and the local dialect. I want to continue to learn everyday Chinese through my interactions with the local people so that I can become able to use Chinese fluently in my work.



Cultivating Global Awareness and Understanding Diversity

Central Glass conducts training to foster a global mindset in employees so that they can participate on the world stage. In FY2017, we conducted training to teach the ideal form of human resource management and leadership in a multicultural environment for mid-level employees in order to provide an opportunity to develop their communication skills and their understanding of different cultures.

Central Glass also began accepting interns from overseas universities at our plants in FY2012 in an effort to promote employee awareness of diversity and improve communication with people from different countries. In FY2017, we hosted three interns from the United States. Through English lessons from the interns and interactions in the workplace, our employees gained confidence in communicating in English and learned to appreciate different cultures and values.

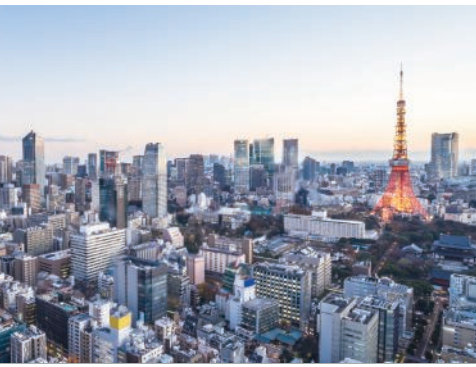
Benefits of Interactions with Interns

- I hesitate less in speaking English thanks to having the opportunity to speak English every week.
(Kazuki Kubo, Glass Manufacturing Technology Center)
- I started to enjoy having conversations in English without being limited by my use of grammar.
(Chiharu Takimoto, Glass Research Center)
- I realized the importance of actively communicating because there are different cultures and ways of thinking.
(Shin Kitagawa, Glass Manufacturing Technology Center)
- I want to learn from the interns who have strong motivation to allocate their time toward independently studying what interests them.
(Atsuko Inoue, Glass Manufacturing Department, Matsusaka Plant)

Number of Interns Accepted

Fiscal year	Number of interns	Nationality of intern(s)
2012	1	UK
2014	2	USA, Korea
2015	1	USA
2016	2	USA
2017	3	USA

*No interns were hosted in FY2013.



To Grow Together with Society

The support of and harmony with members of the local communities are absolutely essential for a company’s continued existence.

The Group will continue to build even better relations with every one of our stakeholders, including members of local communities and customers, while also growing and improving together with society in order to realize a sustainable society.

52nd Central Glass International Architectural Design Competition

Central Glass began sponsoring a competition for architectural design concepts in 1966. Starting with the 10th competition in 1975, it was renamed the Central Glass International Design Competition and has been inviting entries from overseas. The theme of the 52nd competition in 2017 was “Redesigning Urban Open Space.” There were 251 entries in total, 134 from Japan and 117 from overseas (refer to the back cover for the First Place Prize design). The theme of the 53rd International Architectural Design Competition in 2018: “Life, Towns, and Architecture, as Transformed by Autonomous Driving.” We live in a time in which we need to pursue economic efficiency and rationality, while simultaneously preserving the natural environment and protecting historical and traditional cultures. As a company that promotes architectural culture, we believe that it is highly meaningful for us to provide occasions to contemplate a desirable society and environment through this competition. Central Glass takes great pride in our continuing efforts to sponsor this competition over many years.



Award ceremony after the final round of judging

Chief Judge	Hiroshi Naito (Naito Architect & Associates)
Judges	Teruo Kobayashi (Obayashi Corporation)
	Kengo Kuma (Kengo Kuma & Associates)
	Tadao Kamei (Nikken Sekkei Ltd.)
	Jun Aoki (Jun Aoki & Associates)
	Yoshiharu Tsukamoto (Atelier Bow-Wow)
	Satoshi Takayama (Central Glass Co., Ltd.)
	(Titles omitted/arbitrary order)

Laos Elementary School Repair Project to Celebrate the 70th Anniversary of the Labor Union

The Central Glass Labor Union (the “Labor Union”) has been collaborating with the Commission for the Solidarity with the Asian Underprivileged (CSA) as part of its international social contributions to donate two elementary schools to the Lao People’s Democratic Republic.

As a project to celebrate the 70th anniversary of the Labor Union, an inspection team with a total of seven members, including union members selected from each branch, was sent to inspect the site to repair the Hua Na Primary School building donated in 2000 which had aged significantly.

The Hua Na Primary School had deteriorated since it was built over a decade ago and needed repairs immediately, such as classrooms that could no longer be used due to water leaking. The inspection team checked and made a request to the local coordinator to repair the school building from top to bottom to ensure a brilliant and beautiful school facility that would foster uninhibited education to the children.

After the inspection, the team also folded origami such as making helmets from newspaper as well as folding and flying paper airplanes with the children who were attending the school. Even though the team and the children did not share the same language, every member was grateful to have the chance to spend invaluable time bonding with the children.

Thereafter, the CSA reported that the repairs on the Hua Na Primary School building had been completed without issue. The Labor Union hopes to continue supporting the local primary school so that the children of Laos can study with dreams of the future.



Hua Na Primary School



School children

29th Junior Science Classes

A “Summer Vacation Junior Science Class” is held every year, sponsored by the Summer Vacation Junior Science Class Executive Committee and jointly hosted by the Yamaguchi Industrial Promotion Foundation in cooperation with universities, technical colleges, and corporate research institutes. It is held in the hope of showing children, who have infinite future potential, how interesting and fun science can be. In 2017, it was held between July 21 and August 28 at 20 venues in Yamaguchi Prefecture in collaboration with 15 related organizations.

Central Glass supported the program, and held a class at the Chemical Research Center (Ube) on July 25 in which 20 elementary and junior high school students from Ube City and other cities in Yamaguchi Prefecture participated.

Under the theme of “Experiencing the Wonders of Heat and Light!”, young researchers played the role of instructors and prepared hands-on experiments that allowed students to experience the heat energy and light energy found in the ambient environment. Participants formed small groups and seats were prepared for all of the children and their parents to enjoy the class. The children engaged enthusiastically in the experiments, asking the instructors questions and sometimes gasping in surprise, while their parents looked on in enjoyment.

We will continue hosting these classes to provide opportunities for more children to learn the joy of science and increase their interest in science.



Lesson



Participating children

11th Regional Responsible Care Meeting in the Western District of Yamaguchi

The Responsible Care (RC) Committee of the Japan Chemical Industry Association holds regional RC meetings with everyone in the local communities to inform about activities in progress, such as efforts by chemical companies to preserve the environment.

The regional meeting held in the Western District of Yamaguchi is conducted with the participation of six chemical companies located in the area every other year. The 11th meeting was held at the ANA Crowne Plaza Ube in November 2017 with our plant as the organizer.

Each company shared the progress of its RC activities, exchanged ideas with experts as facilitators, and communicated its views on subjects that included seismic countermeasures and corporate informational disclosure.

This year, the event ran successfully with 140 people participating from the six chemical companies, local communities, government agencies, educational institutions, NPOs and local companies.



Regional Meeting

Volunteer Grass Cutting to Prevent the Spread of Fire during Controlled Burn at Akiyoshidai Quasi-National Park

The Ube Branch of the Central Glass Labor Union participates in various volunteer activities. One of those activities is volunteer grass cutting to prevent the spread of fire during a controlled burn on Akiyoshidai mountain at Akiyoshidai Quasi-National Park, held by the Japanese Trade Union Confederation-Rengo Yamaguchi in the middle of November each year. This activity began in 2004 due to the needs of Mine City, Yamaguchi Prefecture, which was suffering from a lack of manpower. As preparation for the traditional controlled burn at Akiyoshidai Quasi-National Park in February every year, volunteers work to create a fire belt to prevent the spread of fire to neighboring mountain forests and orchards. As a result, Mine City has been able to maintain a beautiful landscape through these controlled burns.

Every year, approximately 600 people working in Yamaguchi Prefecture volunteer to cut the grass over a vast area using mowers and sickles. Although this was heavy physical labor that leaves everyone tired, all the volunteers had a positive experience due to the great sense of achievement.

We will continue this activity with the participation and collaboration of all of our employees to protect the traditions of Akiyoshidai Quasi-National Park.



Creating a fire belt

Ube Plant



Address 5253 Okiube, Ube City, Yamaguchi
 Number of employees 534 (as of March 31, 2018)
 Major items produced Fluorine products, other chemicals
 Acquired ISO 14001 certification (December 2000)
 Acquired ISO 9001 certification (December 1997)
 Acquired OHSAS 18001 certification (April 2011)

Message from the General Manager

The Ube Plant, established in 1936 and located in the coastal industrial zone along the inland sea of Ube, started from soda production and expanded to production of fertilizers and fine chemicals products.

Today, the Ube Plant primarily manufactures fine chemicals of organic and inorganic fluorine compounds from raw materials such as hydrofluoric acid. In recent years, we actively strive in environmentally responsible industries by operating an electrolyte plant for lithium ion batteries used as storage batteries, such as those in electric vehicles, and manufacturing products for next-generation non-CFC refrigerants with low global warming potential.

The plant's green spaces have been furnished with rows of cherry trees, and in spring, local residents enjoy the beautiful blossoms and natural environment.

We will continue to make our plant safe and open to local residents.



Takashi Kume
 General Manager
 Ube Plant

Regional Activities

- Carried out cleanup activities for city and prefectural roads on our plant-wide 5S Day (once a month)
- Carried out cleanup activities in Tokiwa Park (once a year)
- Carried out cleanup activities around Ube Higashi Port (once a year)
- Carried out cleanup activities around Lake Ono (once a year)
- Protected and cultivated the grasslands at Akiyoshidai Quasi-National Park (once a year)
- Held regional Responsible Care Meeting in the Western District of Yamaguchi (once every two years)
- Carried out forest maintenance activities to protect water resources (once a year)
- Cleaned roads with road sweepers (every day)
- Held regional Responsible Care Meeting in the Ube District (once every two years)

Preparing for Accidents and Disasters

The industrial complexes that dot Japan handle enormous volumes of high-pressure gases and hazardous materials. Ensuring security at these industrial complexes is therefore a very important element in ensuring the safety and security of the nation's citizens.

In recent years, numerous accidents have occurred at industrial complexes, and their incidence is expected to remain high. Considering this, we work regularly to increase our ability to maintain security and prepare for disasters, and to take preventive steps against trouble. On November 16, 2017, a comprehensive disaster prevention drill was conducted assuming a toxic gas leak inside the Fine Chemicals Manufacturing Plant 1. We practiced our response during an emergency by executing these disaster prevention activities with the cooperation of a total of 140 people from Ube, the Ube Sanyo-Onoda Fire Department, and the plant disaster prevention team.

In addition, Central Glass also confirmed our emergency response procedures within the plant once a year including the ShakeOut earthquake drill, which is an initial earthquake response training method; employee safety confirmation; and post-earthquake status check of the plant during evacuation training that assumes a massive earthquake and tsunami striking the Nankai Trough.

We will continue working to further strengthen our security management. Our employees and business partners are united in their efforts to ensure safety of our plant and neighboring residents.



Emergency Transport Training

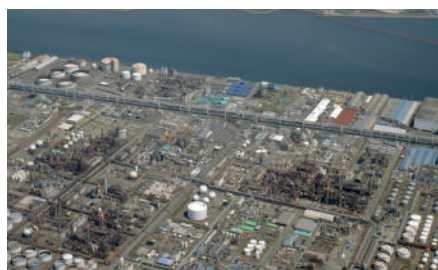
Pollutant Release and Transfer Register (PRTR)

(Unit: kg/year)

Ordinance designation No.	Substance name	Emissions			Compared to previous year	Quantity transported
		Atmosphere	Water	Soil		
16	2, 2'- Azobisisobutyronitrile	0	0	0	→	0
33	Asbestos	0	0	0	→	62,000
41	3'- Isopropoxy - 2 - trifluoromethylbenzanilide (also known as Flutolanil)	0	0	0	→	0
71	Ferric chloride	0	0	0	→	0
80	Xylene	700	0	0	↘	3.4
81	Quinoline	0	0	0	→	0
94	Chloroethylene (also known as vinyl chloride)	0	0	0	→	0
149	Carbon tetrachloride	3,200	0	0	↗	13,000
186	Dichloromethane	490	0	0	↗	1,900
213	N,N-Dimethylacetamide	0	0	0	→	68,000
232	N,N-Dimethylformamide	19	0	0	→	2.4
243	Dioxins (Unit: mg-TEQ/year)	0.020	0.086	0	↘	0
281	Trichloroethylene	1,700	0	0	↘	0
296	1,2,4 - Trimethylbenzene	59	0	0	↘	0
349	Phenol	120	210	0	↗	0
374	Hydrogen fluoride and its water-soluble salts	650	0	0	↘	890
411	Formaldehyde	0	0	0	→	0
438	Methylnaphthalene	54	0	0	↗	0

Quantities emitted, discharged, or transported are listed for those materials handled in amounts exceeding 1,000kg in FY2017 (except for dioxins)

Kawasaki Plant



Address 10-2 Ukishima-cho, Kawasaki-ku, Kawasaki City, Kanagawa

Number of employees 204 (as of March 31, 2018)

Major items produced Inorganic chemicals, organic chemicals
 Acquired ISO 14001 certification (May 2007)
 Acquired ISO 9001 certification (July 2001)

Message from the General Manager

Kawasaki Plant successfully transitioned from the electrolytic soda business to the fine chemicals business. Today, this plant produces a wide range of products from our next-generation fluorine-based foam blowing agent HFO-1233zd (E) with low global warming potential (GWP=1) to pharmaceutical intermediates, photoresist materials, and lithium ion battery electrolytes.

Moreover, the Kawasaki Plant has also started production of next-generation fluorinated solvent that achieves both excellent environmental performance (ODP≈0, GWP <1) and high cleaning performance.

As an effort to reduce industrial waste, the plant actively engages in activities such as reclaiming or recycling inflammable waste oil, and recycling sludge. We will continue to promote activities as we strive to reduce waste even further.

Our environmental activities at Central Glass over many years have been recognized by Kawasaki City. The Kawasaki Plant has been certified as a business site taking environmental action, as defined by the city's bylaws.

Our entire team is united in its efforts to address all aspects of environmental responsibility and commitment to safe operations.



Masaru Narimitsu
 General Manager
 Kawasaki Plant

Regional Activities

- Held Roku-Cho-Kai (Regular local community gatherings with residents of neighboring areas including the Tonomachi and Daishi District)
- Carried out regular cleanups of the roads around the plant
- Regularly exchanged information concerning the environment and safety with employees of neighboring plants in the Kawasaki Industrial Complex
- Participated in joint disaster drills with neighboring business sites in the Ukishima District
- Participated in traffic safety guidance (organized by the Kawasaki Rinko Traffic Safety Association)
- Participated in Tokyo Bay General Survey for Water Environment (Analysis of and report on water quality in Tokyo Bay near plant)
- Carried out environmental safety activities to improve the local environment through the Research Society for Environmental Safety Technology in the Kawasaki Industrial Complex
- Held road safety workshops (attended by Kawasaki-Rinko Police)

Initiatives for Security and Disaster Prevention

Since the Kawasaki Plant is located in an area where industrial complexes are clustered, we are required to maintain a system for security and prevention of disasters at all times, as defined in the Act for the Prevention of Disasters at Petrochemical Complexes, etc. We boost awareness of security and disaster prevention, and keep emergency response systems in place even under normal conditions by conducting plant-wide earthquake disaster prevention drills that assume the occurrence of earthquake-related leaks and fires, training in evacuation from the plant during plant downtime, and training of our plant disaster prevention organization members several times a year.

The Kawasaki Plant is also a member of the Ukishima Joint Disaster Prevention Association, which is made up of companies from the same industry in the Ukishima District in Kawasaki City. Cooperating with each member company, we are building a system to ensure mutual support, including systematic disaster prevention drills, in the event of an incident such as a fire or natural disaster. The member companies also regularly exchange information on security and disaster prevention.



Earthquake disaster prevention drills

PRTR

Ordinance designation No.	Substance name	Emissions			Compared to previous year	Quantity transported
		Atmosphere	Water	Soil		
81	Quinoline	0	0	0	→	0
94	Chloroethylene (also known as vinyl chloride)	0	0.3	0	→	0
104	Chlorodifluoromethane (also known as HCFC-22)	1,100	0	0	↗	0
149	Carbon tetrachloride	240	0.4	0	↘	8,400
213	N,N-Dimethylacetamide	10	0	0	↘	58,000
243	Dioxins (Unit: mg-TEQ/year)	0.37	0.064	0	↗	0
262	Tetrachloroethylene	0	0	0	→	1,300
280	1,1,2 - Trichloroethane	0	0.2	0	↘	1,300
300	Toluene	31	0	0	↗	3,800
374	Hydrogen fluoride and its water soluble salts	0	0	0	→	99
392	n-hexane	0.1	0	0	↘	8,800

Quantities emitted, discharged, or transported are listed for those materials handled in amounts exceeding 1,000kg in FY2017 (except for dioxins)

The Kawasaki Plant is continuing groundwater purification treatment as a result of contamination from a leak of 1,2-dichloroethane in 1982.

Matsusaka Plant



Address 1521-2 Okuchi-cho, Matsusaka City, Mie
 Number of employees 163 (as of March 31, 2018)
 Major items produced Automotive glass
 Architectural and industrial float glass/fabricated glass
 Functional glass for electronic materials
 Acquired ISO 14001 certification (April 2000)
 Acquired ISO 9001 certification (November 2003)
 Acquired IATF 16949 certification (June 2018)

Message from the General Manager

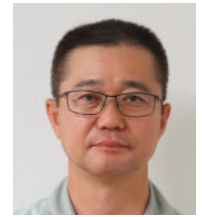
The Matsusaka Plant manufactures polished glass using the world's only duplex equipment capable of employing a consecutive double-sided polishing method. We also manufacture float and fabricated glass for automotive and industrial applications.

Since the plant consumes a huge amount of energy and resources, we are always working to rigorously implement environmental conservation activities.

In order to conserve energy and power and reduce CO₂ emissions, we are working to reduce production loss, introduce equipment that conserves energy in conjunction with large-scale renovations, and implement improvements to our operational technologies.

Since FY2004, we have achieved Zero Emissions by recycling most of the waste glass and we are working to recover valuable materials from our waste (i.e. convert it into products) in order to achieve further reductions.

Each of our employees is continually working to achieve growth and improvement, based on our philosophy, "The Matsusaka Plant: Everything is for people and the global environment - See the future through GLASS." We will continue to contribute to local communities and work to make our plant safe and happy, always remembering to be thankful.



Denzo Tokushima
 General Manager
 Matsusaka Plant

Regional Activities

- Participated in Mie Prefecture Kids' ISO 14000 Program activities
- Participated in cleanup of waste drifting ashore at Toshijima Island, Toba City, organized by the Mie Prefecture Industrial Waste Countermeasures Promotion Council
- Exhibited Eco-Glass at the Matsusaka Environmental Fair held by the Matsusaka City Environmental Partnership Committee
- Participated in the Matsusaka Street Cleanup organized by Matsusaka City
- Lent plant grounds to youth sports associations and other organizations free of charge
- Provided company-owned land to neighboring municipalities as temporary parking areas free of charge
- Invited local residents to the plant's summer festival
- Participated in beach cleanups, organized by Mie University's Mie Global Environment Center for Education & Research
- Participated in voluntary cleanup activities at Matsunase Beach organized by the Matsusaka Taki District Workers' Welfare Council (attended by Matsusaka branch members of the Central Glass Labor Union)
- Held "Ecopap" activities (plastic bottle cap collection) organized by the Matsusaka branch of the Central Glass Labor Union

Safety Initiatives: Danger Simulation Room, OSHMS adoption, and disaster prevention drills

The Matsusaka Plant carries out danger simulation workshops with the aim of developing one's sense of danger and raising the safety awareness of each and every employee. A cutter safety simulator was introduced in FY2017 to provide employees exposure to the dangers associated with using cutters. In FY2018, we also installed a machine to simulate hands becoming entangled in suspension wires to provide employees exposure to the dangers associated with entanglement accidents.

In addition to heightening sensitivity toward danger through this educational facility, Central Glass has also been operating an Occupational Safety and Health Management System (OSHMS) since FY2018 to enhance safety management. We conduct measures such as risk assessments and internal audits in accordance with this system as we continually try to improve any issues.

As a measure to reinforce security and disaster prevention, we conducted initial response training in March 2018 assuming a fire around the north gate. During this training, we verified that the following systems could be executed without any issue: the reporting line for discovery of the incident and contact to government agencies, the assembly of the self-defense fire-fighting team who are on a three-shift system and confirmation of their fire-fighting capabilities, establishment of an emergency disaster prevention headquarters, as well as roll call and checking the status reporting contact system. We will continue disaster prevention drills at the plants to ensure the ability to rapidly respond in the event of an emergency.



Cutter safety simulator



Disaster prevention drills

PRTR

(Unit: kg/year)

Ordinance designation No.	Substance name	Emissions			Compared to previous year	Quantity transported
		Atmosphere	Water	Soil		
132	Cobalt and its compounds	0	0	0	→	0
242	Selenium and its compounds	87	0	0	↗	0
412	Manganese and its compounds	46	0	0	↘	0
438	Methylnaphthalene	28	0	0	↗	0

Quantities emitted, discharged, or transported are listed for those materials handled in amounts exceeding 1,000kg in FY2017 (except for dioxins)

In FY2002, the Matsusaka Plant discovered groundwater containing arsenic and lead attributable to a past production method. The plant is currently continuing groundwater purification treatment.

Matsusaka Plant Sakai Manufacturing Site



Address 6 Chikko-Minamimachi, Sakai-ku, Sakai City, Osaka

Number of employees 35 (as of March 31, 2018)

Major items produced Architectural and residential flat glass, flat glass for electronic materials, architectural frosted glass

Acquired ISO 14001 certification (December 1999)
Acquired ISO 9001 certification (February 1999)

Message from the General Manager

The Sakai Manufacturing Site is located in the center of the Coastal Industrial Zone in Sakai City, Osaka, and it has been manufacturing flat glass continuously since 1959 as the birthplace of the glass business of Central Glass. In 1982, we adopted the float process as our manufacturing method and started manufacturing float glass.

In FY2007, we completed our second cold repair work (repairs of the entire manufacturing line including the melting furnace). As part of this process, we conducted improvement work that reduced our CO₂ emissions by 3%, and restarted production in April 2008.

In May 2012, we completed our installation of sputtering equipment that deposits a thin metallic coating on glass surfaces and began manufacturing Eco-Glass, a product that can reduce the cost of cooling and heating buildings.

Today, the Sakai Manufacturing Site is furthering the reduction of energy per unit by reviewing furnace operating conditions and improving the productivity of the glass-melting furnace. We are also continuing efforts to reduce waste even further by recycling waste and advancing the recovery of valuable materials from waste.



Nobuhisa Tanise
General Manager
Sakai Manufacturing Site
Matsusaka Plant

Regional Activities

- Participated in the Osaka Bay Cleanup Project
- Sponsored a flea market and donated proceeds to social welfare activities
- Sent employees to support rescue, fire suppression and first aid in case of a large-scale disaster as a member of the Sakai City Disaster Response Committee
- Provided support for a project conducted by the Osaka Port Cleanup Association in Sakai Senboku Port to ensure the safety of ships navigating through the port and protect the environment
- Held a blood donation drive at the Sakai Manufacturing Site
- Participated in Sakai Fire Department CPR workshops (4 employees)
- Carried out cleanups of coastal roads

Osaka Bay Cleanup Project

The Sakai Manufacturing Site and Central Glass Plant Services Co., Ltd. have taken part in beautification activities conducted along the Osaka Bay sea walls every year as part of a project organized by Osaka Prefecture to remove trash and ensure the cleanliness of the water in Osaka Bay.

A total of 200 people participated from government agencies, corporations, and community groups in this activity sponsored by the Port of Osaka, Sakai Port Common Government Office and the Sakai Fisheries Co-operative Association.

The scope of the activity in the last several years has covered the western shore of Sakai District 2. Participants collected garbage such as large tires, in addition to other trash made up mostly of wooden debris and plastics. Although the progress is slow, quantities of large plastic garbage are gradually decreasing and environmental awareness is spreading within the local community. We will continue to take part in this activity while cooperating with government agencies and local companies who desire an Osaka Bay free of trash.



Cleanup

PRTR

Ordinance designation No.	Substance name	Emissions			Compared to previous year	Quantity transported
		Atmosphere	Water	Soil		
80	Xylene	99	0	0	↗	0
296	1,2,4 - Trimethylbenzene	110	0	0	↗	0

Quantities emitted, discharged, or transported are listed for those materials handled in amounts exceeding 1,000kg in FY2017 (except for dioxins)

(Unit: kg/year)

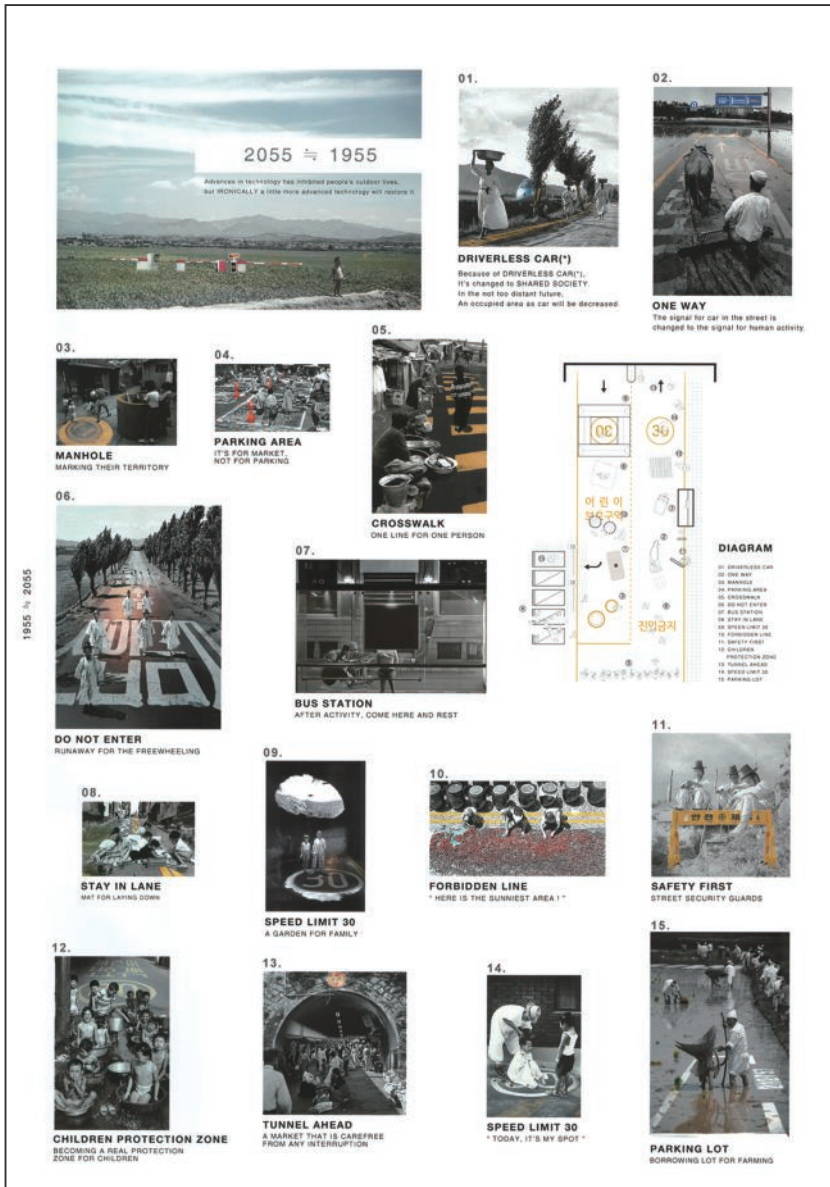
The 52th Central Glass International Architectural Design Competition

Theme: Redesigning Urban Open Spaces

The theme for the 52th Design Competition was to consider changes in the conditions of contemporary society and re-design open spaces in cities as people-oriented areas that attract large numbers of users.

First place

Sohee Youn (University of Seoul, South Korea)
Suji Choi (University of Seoul, South Korea)
Injun Kang (Dongguk University, South Korea)



CENTRAL GLASS CO., LTD.

Contact: **Environment, Safety and Quality Management Department**
Kowa-Hitotsubashi Bldg, 7-1 Kanda-Nishikicho 3-chome, Chiyoda-ku, Tokyo, 101-0054 Japan
TEL: +81-(0)3-3259-7359 FAX: +81-(0)3-3259-7394 <http://www.cgj-cp.com/>



This printing product is produced from environment-friendly materials by the Green Printing certified factory.



This printed material uses FSC® certified paper containing raw materials from well-managed forests.



Printed on paper made with wood from forest thinning. "Morino Chonai-Kai" (Forest Neighborhood Association)—Supporting sound forest management.



This booklet was printed with an environmentally friendly ink that contains no volatile organic compound (VOC).