

80<sup>th</sup>  
Anniversary



Responsible Care Report

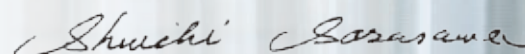
Social & Environmental  
Report

2016

Creating a Better Future Through *Monozukuri*

 **CENTRAL GLASS CO., LTD.**

# Contributing to the Establishment of a Truly Prosperous Society through *Monozukuri*



Shuichi Sarasawa  
Representative Director, President & CEO  
Central Glass Co., Ltd.

## 80th Anniversary

The Central Glass Group will mark its 80th anniversary in October 2016. The Group's origins lie in Ube Soda Industry Co., Ltd., which was founded in 1936. At Central Glass, which started out as a chemical company based on industrial soda products and later grew to also include fertilizers, we have a strong tradition of contributing to the establishment of a truly prosperous society through the spirit of *Monozukuri*. The Central Glass Group remains committed to this aspiration that we have carried with us since our founding as we head toward our 80th and then our 100th anniversaries. Along the way, we will pursue sustainable growth while deepening our ties with stakeholders, including customers and local communities.

## ■ Aiming to Increase Our Corporate Value

### We will create value through highly functional products based on our original technologies.

We believe that in order for a company to grow sustainably and contribute to the development of society, the most important thing is to continually create value that will lead to solutions for society and customers.

The Central Glass Group's basic policy is to develop original products that meet the diversity of market needs accompanying changes in the social environment. In addition to expanding and strengthening our existing business fields, we are diligently engaged in R&D with the aim of developing products that will form the core of new business in the future. We are conducting R&D for glass products under the concept of high functionality, including energy savings, security, and acoustic and thermal insulation. We are also carrying out R&D for chemical products with a focus on fundamental research to discover technologies that

match market needs.

In fiscal 2015, we developed a unique and innovative new material for the semiconductor industry by combining glass surface treatment technology from our glass division with high-quality semiconductor material mass-production technology from our chemicals division. Furthermore, we are committed to developing products with low global warming potential with the aim of realizing CFC-free alternatives. Going forward, the Central Glass Group will pursue further technological development and continue to plan business attuned to societal needs.

## ■ Human Resource Development

### We are committed to human resource development and diversity promotion.

At the Central Glass Group we believe that *Monozukuri* starts with *Hitozukuri*, or the development of human resources. Accordingly, we focus on *Hitozukuri* as the foundation of our corporate growth, and strive to enhance our human resource development and HR programs. As international competition intensifies, we have established a variety of educational programs to help our employees acquire not just language skills but also the ability to conduct business in light of cultural sensibilities and values in order to develop human resources capable of playing an active role on the global stage. We are also enthusiastically working to promote diversity. Just as combining glass products with chemical products creates high added value, new value can be created when diverse human resources bring their talents together. We are working to provide opportunities and establish systems that will enable all kinds of people to play an active role regardless of age, gender, or nationality.



## ■ Realization of Our Corporate Philosophy

We will contribute to the establishment of a truly prosperous society through *Monozukuri*.

In March 2015, the Central Glass Group articulated the aspirations cultivated and shared since the Company's establishment as the Central Glass Group Corporate Philosophy.

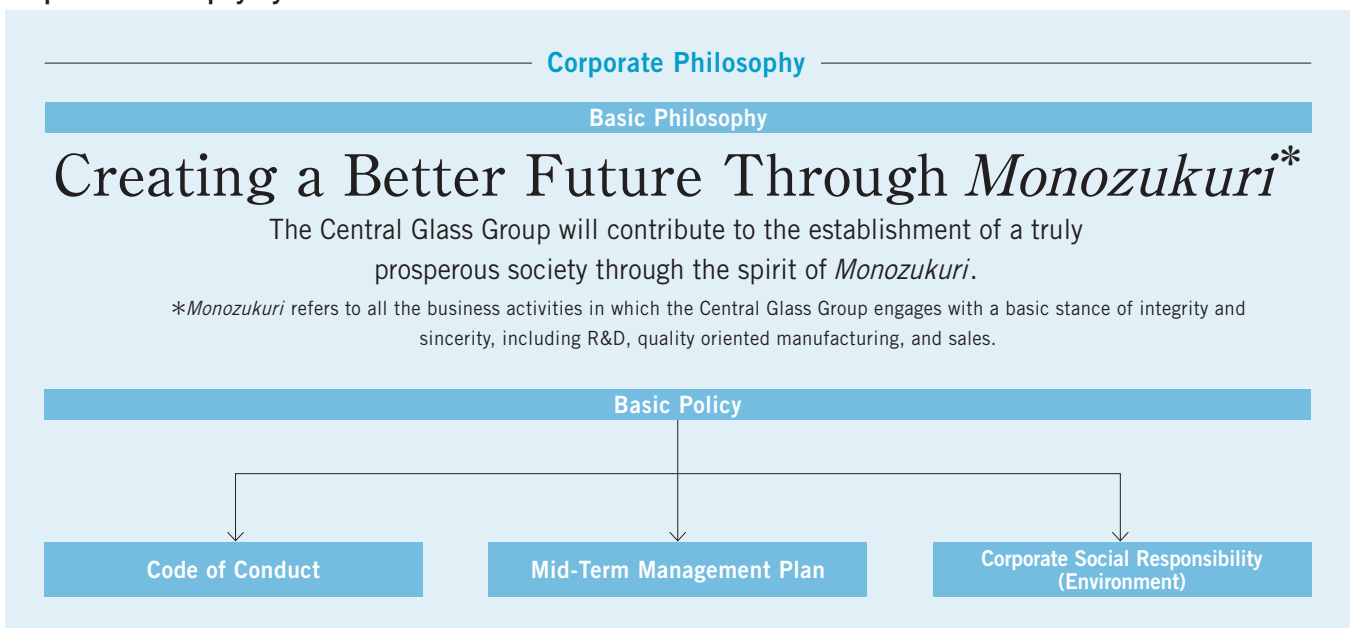
The Corporate Philosophy comprises the Basic Philosophy and Basic Policy. The Basic Philosophy is "Creating a Better Future Through *Monozukuri*". The Central Glass Group will contribute to

the establishment of a truly prosperous society through the spirit of *Monozukuri*.

The Basic Policy presents a more specific direction in which to move toward achievement of the Basic Philosophy. It consists of four policies: (1) Create new value through original technology; (2) Pursue harmony with the environment and harmonious coexistence with society; (3) Strive to increase corporate value powered by global growth; and (4) Aspire to be a vibrant company that respects the pioneering spirit and diversity.

The Corporate Philosophy represents the aspirations that the Central

## Corporate Philosophy System



## ■ Top Message

Glass Group must communicate to its stakeholders. It will serve as the starting line from which we carry out the Central Glass Group's corporate activities, and I believe that it will increase our sense of identity and strengthen our power as a Group.

## ■ Mid-Term Management Plan

**We are pursuing new growth based on three key phrases: (1) Environment and energy, (2) Life sciences, and (3) Comfortable living.**

The Central Glass Group have formulated a five-year medium-term management plan that began in fiscal 2014. Under the plan, we are implementing four basic strategies with a core policy of "achieving new growth by strengthening our business foundations and original technologies."

The four strategies are: (1) Achieve revenue growth through aggressive investment in growth businesses, focusing on the key phrases of environment and energy, life sciences, and comfortable living; (2) Promote structural reforms in existing core businesses; (3) Aggressively expand overseas operations and strengthen Group management; and (4) Strengthen our R&D structure with our eyes set ten years into the future.

In fiscal 2015, the second year of our medium-term management plan, we increased sales through our growing businesses of gases for pharmaceuticals and semiconductors as well as aggressive overseas expansion of automotive glass. In addition to this increased revenue, we secured greater income as a result of Group-wide efforts to reduce the costs of both manufacturing and sales.

In our chemicals business, we are currently building additional production plants for the growing businesses of fluorocarbon products, intermediates for pharmaceuticals/agrochemicals, and WF<sub>6</sub> for



semiconductors, and we plan to start commercial production in fiscal 2016. Outside Japan, a production facility for electrolytes for lithium-ion batteries was completed in South Korea in 2015, and another was completed in China in April 2016.

We are now preparing to expand our sales targeting the Asian market, which is expected to explode in the future. We will also stabilize the earnings base of the glass business.

We are determined to continue strengthening our production and sales systems and promoting all-around management efficiency. At the same time, we will focus our management resources on growth businesses and work to bolster the Group's corporate capabilities by accelerating overseas expansion.

We look forward to your continued understanding and support as we move ahead into the future.

## Environmental Principles

Central Glass will help create a truly prosperous society through the production of goods and services by giving consideration to the global environment, health, and safety at all times.

**“Doing everything in the interests of humanity and the global environment.”**

### Action Guidelines

- 1 We will give consideration to the protection of the global environment and people's health and safety on a group-wide scale in all activities spanning from R&D to production and sales.
- 2 We will build frameworks and systems that promote environmentally-conscious corporate activities and strive to make continual improvements.
- 3 We will make efforts to develop products and production technologies that are friendly to the global environment.

- 4 We will strive to build a recycling-based society by effectively using the earth's resources and by recycling waste.
- 5 We will observe laws and regulations relating to the environment, health and safety, and make efforts in communicating with citizens.
- 6 As an employee of the company, each and every one of us will strive to contribute to society with a focus on the local community.

## Editorial Policy

We in the Central Glass Group have published this report with the objective of engaging in a dialogue with all of our stakeholders by reporting on our social and environmental activities. In preparing this report, our goal was to make it easy to read and understand in order to thoroughly inform readers of our activities.

### Reference Guidelines

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

### Report period

April 2015 to March 2016  
(The period for overseas companies was from January to December 2015)

### Scope of the report

Central Glass Group  
(The scope of data was only gathered from the plants and research institutes of Central Glass Co., Ltd. along with some of its subsidiaries.)

#### What Is Responsible Care (RC)?

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



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# Business Outline of the Central Glass Group

Europe  
4  
companies

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

Japan  
26  
companies

Asia  
13  
companies

Yue Sheng Industrial Co., Ltd. (Taiwan)  
Taiwan Central Glass Co., Ltd. (Taiwan)  
Giga Gas & Electronic Materials Company (Taiwan)  
Central Glass Trading (Shanghai) Co., Ltd. (China)  
Zhejiang Central Glass Chemspec Company Ltd. (China)  
Giga Gas & Electronic Materials Trading (Shanghai) Co., Ltd. (China)  
Saint-Gobain Central Sekurit (Qingdao) Co., Ltd. (China)

Central Glass (Zhangjiagang) Co., Ltd. (China)  
Central Glass Korea Co., Ltd. (South Korea)  
JCEL Co., Ltd. (South Korea)  
Thai Central Chemical Public Co., Ltd. (Thailand)  
Japan Vietnam Fertilizer Company (Vietnam)  
Central Glass Company India Private Limited (India)

## ➤ Corporate Outline (as of March 31, 2016)

|                              |                            |
|------------------------------|----------------------------|
| <b>Company Name</b>          | Central Glass Co., Ltd.    |
| <b>Established</b>           | October 10, 1936           |
| <b>Number of Employees</b>   | 1,645 (7,052 consolidated) |
| <b>Capital</b>               | 18,168.28 million          |
| <b>Listed Stock Exchange</b> | Tokyo Stock Exchange       |

## ➤ List of Workplaces

**Head Office**  
Kowa-Hitotsubashi Bldg., 7-1 Kanda-Nishikicho 3-chome, Chiyoda-ku, Tokyo, Japan

**Chemical Research Center (Tokyo)**  
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

## ► Business Division/Segment/Major Products

|                    |                                |   |
|--------------------|--------------------------------|---|
| Glass Business     | Architectural glass            | Float glass, figured glass, wired glass, heat reflective glass, fabricated glass (tempered glass, fire-resistant tempered glass, laminated glass, insulating glass units, crime-prevention glass), mirrors, anti-fog mirrors, decorated glass |
|                    | Automotive glass               | IR-cut glass, UV-cut glass, glass antennas, privacy glass, module glass, acoustic glass, glass with conductive heating defogger print, 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 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 fibers                   | Glass fiber, glass wool   |

America  
7  
companies

Central Glass Co., Ltd.  
Tohoku Garasu Kenzai Co., Ltd.  
Central Glass Sale Co., Ltd.  
Central Glass Engineering Co., Ltd.  
Tosho Central Co., Ltd.  
Niigata Yoshino Gypsum Co., Ltd.  
Central Chemical Co., Ltd.  
Central Saint-Gobain Co., Ltd.  
Central Glass Module Co., Ltd.  
Bishu Silica Sand Co., Ltd.  
Japan Tempered & Laminated Glass Co., Ltd.  
Central Insulation Co., Ltd.  
Central Glass Fiber Co., Ltd.  
Mie Glass Industry Co., Ltd.  
Central Glass Plant Services Co., Ltd.

Sowa Transportation and Warehouse Co., Ltd.  
Takada Co., Ltd.  
Ube Trading Co., Ltd.\*  
Central Engineering Co., Ltd.  
Ube Delivery Co., Ltd.  
Central Service Co., Ltd.  
Ube Analytical Center Co., Ltd.  
Ube Yoshino Gypsum Co., Ltd.  
Ube Ammonia Industries Co., Ltd.  
Central Saint-Gobain Investment Co., Ltd.  
TOKUYAMA & CENTRAL SODA Inc.

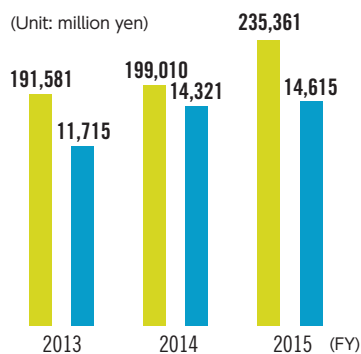
\* Ube Delivery Co., Ltd., merged with Ube Trading Co., Ltd., and is now Ube Trading Co., Ltd.

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

## ► Trends in net sales and ordinary income (consolidated)

■ Net sales ■ Ordinary income

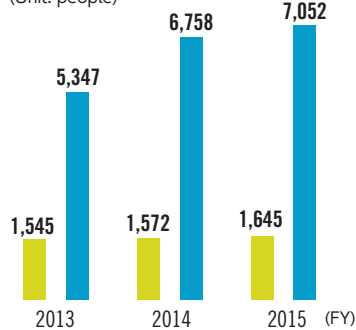
(Unit: million yen)



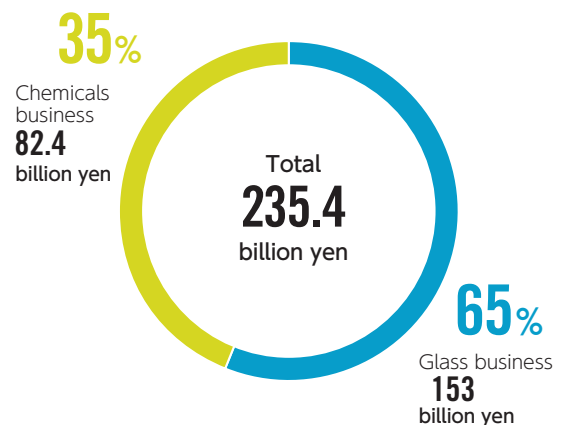
## ► Trends in the number of employees

■ Non-consolidated ■ Consolidated

(Unit: people)



## ► FY2015 sales by segment (consolidated)



# The Central Glass Group's Products in Society

The Central Glass Group supplies products related to the business fields of glass and chemicals. Although the products of Central Glass may not be visible to the general consuming public, they support many aspects of a comfortable daily life, as well as a well-functioning society and industry. We provide raw materials for glass products used for buildings/residences and automotive glass products, as well as raw materials for industrial products, materials supporting industrial production processes, fertilizers for agricultural produce, and medical drugs. 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 as well in order to develop and provide environmentally friendly products and products that take people's health and safety into consideration.



Architectural glass



Glass for electronic materials



Automotive glass

# Glass Business

## Architectural glass

We offer a variety of glass products, ranging from standard to high-performance and special-purpose products for the architectural and housing industries in Japan. We are especially trying to expand products focused on safe and secure living environments, reducing environmental impact, and saving energy.

## Automotive glass

We provide laminated and tempered glass in the form of automobile window glass that increases the safety of passengers. In addition to enhanced safety, we offer a broad range of high-quality glass that contribute to greater vehicle and passenger comfort through functions like sound insulation and reduction of infrared and UV rays.

## Glass for electronic materials

We offer products such as thin flat glass for the LCDs used in the IT and electronics industries, as well as powdered glass and glass paste. We are also committed to developing environmentally friendly formulas and products that do not contain lead or heavy metals.





### Fine chemicals

(Active ingredients & intermediates for pharmaceuticals/agrochemicals)



### Fine chemicals

(Process materials for semiconductors/  
liquid crystal production)



### Fine chemicals

(Electrolytes for lithium-ion batteries)



### Fertilizers

(Coated fertilizer)



### Glass fibers



### Basic chemicals

(Fluorocarbon)

# Chemicals Business

## Basic chemicals

We are developing fluorocarbon products with a low environmental impact. These products were born from the fusion of the chlorination, fluorination, and mass-production technologies that Central Glass has cultivated. We also provide inorganic and organic chemicals that are the base materials for various industries.

## Fine chemicals

We operate an R&D-driven business centered on fluorination technology. We offer high-purity and high-performance products including active ingredients and intermediates in the fields of pharmaceuticals/agrochemicals and semiconductors.

## Fertilizers

We mainly provide ammonium chloride-based fertilizer for rice paddies as Japan's only manufacturer of this product. We also handle environmentally friendly coated fertilizer (Cera-coat) as well as microbial agrochemicals and materials made from microorganisms that exist in the natural world to support environmentally friendly agriculture.

## Glass fibers

We provide products in both the long fiber (glass fiber) and short fiber (glass wool) fields. We focus on specialty materials and products mainly used in automotive and electronic applications.

# 50 Years of the Central Glass International Architectural Design Competition

Contributing to Society by Helping to Foster Human Resources in the Architectural World through the Competition

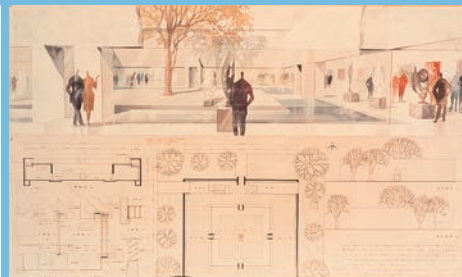
## What is the Central Glass International Architectural Design Competition?

The Central Glass International Architectural Design Competition sponsored by Central Glass began in 1966, two years after we started producing polished sheet glass through the Duplex process in 1964. The 50th Competition was held last year (2015). Over the past 50 years, the competition has received entries from over 20,000 people. It is the oldest and most prestigious architectural design competition in the Japanese architectural world.

The competition has sparked interest among students who aspire to be architects as well as among professionals working both at architectural firms and in the design departments of general contractors. Since its tenth year, the competition has taken on an international flavor, broadly seeking entries from both inside and outside Japan. Authorities

from the Japanese architectural world are invited to serve as judges.

The unique themes demand free-thinking, inspiring ideas and deep meditation. In recent years, many of them have been related to society and the environment, and we hope that this competition serves as an opportunity to consider what kinds of societies and environments are desirable.



First Place design in the 1st Competition (1966)  
Theme: Building Using Large Plate Glass

\*Judges

1966

**1st: Building Using Large Plate Glass**

\*Hajime Shimizu, Ryuichi Hamaguchi, Kiyoshi Seike, Yo Ikebe, Shinichi Sakaguchi

1967

**2nd: Commercial Building Using Large Plate Glass**

\*Hajime Shimizu, Shoichi Sano, Junzo Yoshimura, Ryuichi Hamaguchi, Yoshinobu Ashihara, Shoji Hayashi, Giyu Kawahara

1968

**3rd: Exhibition Pavilion on the Competition Theme "The Future of Glass"**

\*Togo Murano, Motoo Take, Ryuichi Hamaguchi, Kiyoshi Seike, Yoshinobu Ashihara, Shoji Hayashi, Giyu Kawahara

1969

**4th: Drive-in Restaurants**

\*Togo Murano, Motoo Take, Ryuichi Hamaguchi, Yoshinobu Ashihara, Masato Otaka, Shoji Hayashi, Takasuke Kijima

1970

**5th: Glass-Enclosed Artificial Environments**

\*Togo Murano, Motoo Take, Ryuichi Hamaguchi, Fuminaga Kiyoda, Takekuni Ikeda, Takasuke Kijima

1971

**6th: Shopping Center Using Glass**

\*Hajime Shimizu, Togo Murano, Motoo Take, Fuminaga Kiyoda, Takekuni Ikeda, Shinichi Okada, Takasuke Kijima

1972

**7th: Community Plaza**

\*Togo Murano, Kiyoshi Seike, Kisaburo Ito, Takekuni Ikeda, Shinichi Okada, Takasuke Kijima

1973

**8th: Leisure Village Clubhouse**

\*Kenzo Tange, Motoo Take, Kisaburo Ito, Takekuni Ikeda, Shinichi Okada, Minoru Takeyama, Takasuke Kijima

1974

**9th: Modern Museum in a Natural Environment**

\*Kenzo Tange, Motoo Take, Kisaburo Ito, Takekuni Ikeda, Fumihiko Maki, Shinichi Okada, Takasuke Kijima

1975

**10th: Beautiful Glass Architecture**

\*Kenzo Tange, Motoo Take, Kisaburo Ito, Takekuni Ikeda, Fumihiko Maki, Shinichi Okada, Takasuke Kijima

1976

**11th: Modern Architecture in an Historic Environment**

\*Kenzo Tange, Motoo Take, Kisaburo Ito, Takekuni Ikeda, Fumihiko Maki, Shinichi Okada, Takasuke Kijima

1977

**12th: Sea Food Restaurant Composed with Light Graduation**

\*Kenzo Tange, Motoo Take, Kisaburo Ito, Takekuni Ikeda, Fumihiko Maki, Shinichi Okada, Takasuke Kijima

1978

**13th: Cinema That Supports the Revival of Film**

\*Kenzo Tange, Motoo Take, Kisaburo Ito, Takekuni Ikeda, Fumihiko Maki, Shinichi Okada, Hiroshi Takashima  
Special Judge: Hiroshi Teshigahara (film director)

1979

**14th: Club For Retired Senior Citizens**

\*Kenzo Tange, Motoo Take, Kisaburo Ito, Takekuni Ikeda, Fumihiko Maki, Shinichi Okada, Hiroshi Takashima

1980

**15th: Town Museum for Era**

\*Kenzo Tange, Motoo Take, Kisaburo Ito, Takekuni Ikeda, Fumihiko Maki, Shinichi Okada, Hiroshi Takashima

1981

**16th: Meditation Chapel**

\*Kisaburo Ito, Takekuni Ikeda, Fumihiko Maki, Shoji Hayashi, Shinichi Okada, Akizo Uchii, Hiroshi Takashima

1982

**17th: Crystal Palace**

\*Kisaburo Ito, Takekuni Ikeda, Fumihiko Maki, Shoji Hayashi, Shinichi Okada, Akizo Uchii, Yoshiaki Suenaga

1983

**18th: Museum of Sculpture**

\*Kisaburo Ito, Takekuni Ikeda, Fumihiko Maki, Shoji Hayashi, Shinichi Okada, Akizo Uchii, Yoshiaki Suenaga

1984

**19th: A Glass Tower**

\*Kisaburo Ito, Takekuni Ikeda, Yosiro Ikehara, Shoji Hayashi, Kisho Kurokawa, Kazuhiro Ishii, Yoshiaki Suenaga

1985

**20th: A Space with An Atrium**

\*Kisaburo Ito, Takekuni Ikeda, Yosiro Ikehara, Shoji Hayashi, Kisho Kurokawa, Kazuhiro Ishii, Yoshiaki Suenaga

1986

**21st: A Monument in Glass for the Year 2001**

\*Kisaburo Ito, Takekuni Ikeda, Yosiro Ikehara, Shoji Hayashi, Kisho Kurokawa, Kazuhiro Ishii, Yoshiaki Suenaga

1987

**22nd: Intelligent Market**

\*Kisaburo Ito, Takekuni Ikeda, Yosiro Ikehara, Shoji Hayashi, Kisho Kurokawa, Kazuhiro Ishii, Yoshihiro Kodama

1988

**23rd: Museum of Modern Architecture**

\*Kisaburo Ito, Takekuni Ikeda, Yosiro Ikehara, Shoji Hayashi, Kisho Kurokawa, Kazuhiro Ishii, Yoshihiro Kodama

1989

**24th: A Terminal for the Linear Motor Car**

\*Kisaburo Ito, Takekuni Ikeda, Shoji Hayashi, Kisho Kurokawa, Takafumi Aida, Kazuhiro Ishii, Yoshihiro Kodama

1990

**25th: Glass House 2001**

\*Kisaburo Ito, Takekuni Ikeda, Shoji Hayashi, Kisho Kurokawa, Takafumi Aida, Kazuhiro Ishii, Masami Umemoto

20

1991

**26th: East Meets West**

\*Kisaburo Ito, Takekuni Ikeda, Shoji Hayashi, Kisho Kurokawa, Takafumi Aida, Kazuhiro Ishii, Kazuo Suzuki

1992

**27th: A School of Architecture**

\*Kisaburo Ito, Takekuni Ikeda, Shoji Hayashi, Kisho Kurokawa, Takafumi Aida, Kazuhiro Ishii, Kazuo Suzuki

1993

**28th: Museum of the 20th Century**

\*Kisaburo Ito, Takekuni Ikeda, Kisho Kurokawa, Takafumi Aida, Yoshiaki Ogura, Kazuhiro Ishii, Kazuo Suzuki

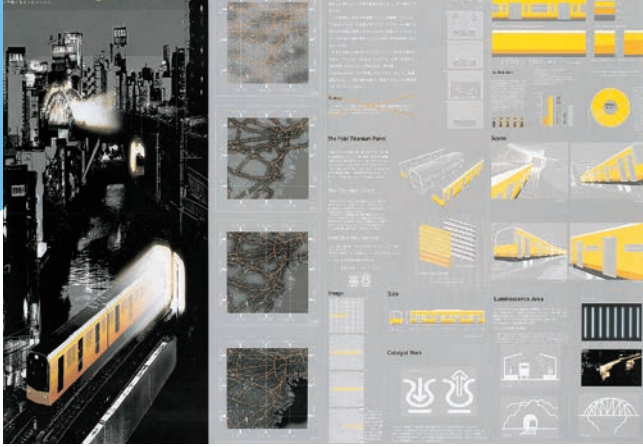
1994

**29th: Glass Teahouse**

\*Kisaburo Ito, Takekuni Ikeda, Kisho Kurokawa, Takafumi Aida, Yoshiaki Ogura, Kazuhiro Ishii, Tomoyuki Inokuchi

10

1



First Place design in the 34th Competition (1999). Theme: Environmentally Friendly Architecture.

1995

**30th: Guest House**

\*Takekuni Ikeda, Kisho Kurokawa, Takefumi Aida, Yoshiaki Ogura, Kazuhiro Ishii, Riken Yamamoto, Tomoyuki Inokuchi

1996

**31st: National Assembly Building**

\*Takekuni Ikeda, Kisho Kurokawa, Takefumi Aida, Yoshiaki Ogura, Kazuhiro Ishii, Riken Yamamoto, Tomoyuki Inokuchi

1997

**32nd: Millennium Tower**

\*Takekuni Ikeda, Kisho Kurokawa, Takefumi Aida, Yoshiaki Ogura, Kazuhiro Ishii, Riken Yamamoto, Tomoyuki Inokuchi

1998

**33rd: Three-Dimensional Urban Park**

\*Kisho Kurokawa, Kiyoshi Sakurai, Tetsuo Naito, Yoshiaki Ogura, Toyo Ito, Kazuhiro Ishii, Riken Yamamoto, Tomoyuki Inokuchi

1999

**34th: Environmentally Friendly Architecture**

\*Kisho Kurokawa, Kiyoshi Sakurai, Tetsuo Naito, Yoshiaki Ogura, Toyo Ito, Kazuhiro Ishii, Riken Yamamoto, Tomoyuki Inokuchi

40

2005

**40th: A Town Landmark**

\*Toyo Ito, Masaru Okamoto, Riken Yamamoto, Kiyoshi Sakurai, Taro Ashihara, Kengo Kuma, Yutaka Suzurikawa

2006

**41st: Conversion of an Existing Building for City Life**

\*Toyo Ito, Masaru Okamoto, Riken Yamamoto, Kiyoshi Sakurai, Taro Ashihara, Kengo Kuma, Yutaka Suzurikawa

2007

**42nd: Environmental Zoo**

\*Toyo Ito, Masaru Okamoto, Riken Yamamoto, Kiyoshi Sakurai, Taro Ashihara, Kengo Kuma, Kunito Takahashi

2008

**43rd: Architecture Coexisting with World Heritage Sites**

\*Toyo Ito, Masaru Okamoto, Riken Yamamoto, Kiyoshi Sakurai, Taro Ashihara, Kengo Kuma, Kunito Takahashi

2009

**44th: A Community Gathering Space**

\*Toyo Ito, Masaru Okamoto, Riken Yamamoto, Kiyoshi Sakurai, Taro Ashihara, Kengo Kuma, Kunito Takahashi

2010

**45th: Housing for Better Urban Environments**

\*Riken Yamamoto, Masaru Okamoto, Hiroshi Naito, Kiyoshi Sakurai, Taro Ashihara, Kengo Kuma, Kunito Takahashi

2011

**46th: Glass Architecture in 2050**

\*Riken Yamamoto, Masaru Okamoto, Hiroshi Naito, Kiyoshi Sakurai, Taro Ashihara, Kengo Kuma, Takashi Nagahama

2012

**47th: Town Hall in a Regional Environment**

\*Riken Yamamoto, Teruo Kobayashi, Hiroshi Naito, Kiyoshi Sakurai, Taro Ashihara, Kengo Kuma, Takashi Nagahama

2013

**48th: Bringing the Urban Environment into Architecture**

\*Riken Yamamoto, Teruo Kobayashi, Hiroshi Naito, Kiyoshi Sakurai, Taro Ashihara, Kengo Kuma, Takashi Nagahama

2014

**49th: A City Symbol Loved by Residents**

\*Riken Yamamoto, Teruo Kobayashi, Hiroshi Naito, Keiichi Okamoto, Taro Ashihara, Kengo Kuma, Satoshi Takayama

# 50th Central Glass International Architectural Design Competition

The theme for the 50th Design Competition (2015) was "The Glass." There were 136 entries in total, 68 each from Japan and from overseas. Over its 50 years, the competition has received 21,530 entries in total, 14,410 from within Japan and 7,120 from over 70 foreign countries.

**Chief Judge**

Riken Yamamoto (Riken Yamamoto & Field Shop)

**Judges** (titles omitted; in no particular order)

- Keiichi Okamoto (Nikken Sekkei Ltd.)
- Taro Ashihara (Taro Ashihara Architects)
- Teruo Kobayashi (Obayashi Corporation)
- Hiroshi Naito (Naito Architect & Associates)
- Kengo Kuma (Kengo Kuma & Associates)
- Satoshi Takayama (Director & Executive Managing Officer, Central Glass Co., Ltd.)



Award ceremony after the final screening (First Place)

30

2000

**35th: Small Public Space in Glass**

\*Toyo Ito, Tetsuo Naito, Masaru Okamoto, Itsuko Hasegawa, Riken Yamamoto, Kengo Kuma, Norihisa Yamamoto

2001

**36th: Glass House 2001**

\*Toyo Ito, Tetsuo Naito, Masaru Okamoto, Itsuko Hasegawa, Riken Yamamoto, Kengo Kuma, Norihisa Yamamoto

2002

**37th: Restaurant in the Fields**

\*Toyo Ito, Tetsuo Naito, Masaru Okamoto, Itsuko Hasegawa, Riken Yamamoto, Kengo Kuma, Norihisa Yamamoto

2003

**38th: Library for a New Era**

\*Toyo Ito, Masaru Okamoto, Riken Yamamoto, Kiyoshi Sakurai, Taro Ashihara, Kengo Kuma, Norihisa Yamamoto

2004

**39th: Asia Front Village**

\*Toyo Ito, Masaru Okamoto, Riken Yamamoto, Kiyoshi Sakurai, Taro Ashihara, Kengo Kuma, Yutaka Suzurikawa

First Place design in the 48th Competition (2013)  
Theme: Bringing the Urban Environment into Architecture



A fiftieth anniversary lecture event and party were held last year to commemorate the fiftieth anniversary of the Central Glass International Architectural Design Competition.

**Commemorative Lectures**

**1. "Inquiry through Competition"**

Yoshiharu Tsukamoto (Joint Representative, Atelier Bow-Wow; Professor, Tokyo Institute of Technology)

**2. "What Architecture Must Consider Now"**

Nobuaki Miyashita (Takenaka Corporation) & Takeshi Hosoka (Representative, TAKESHI HOSAKA Architects; Associate Professor, Art and Architecture School of Waseda University)

**3. "The Potential of Architecture Revealed over 20 Years of Judging"**

Riken Yamamoto (Representative, Riken Yamamoto & Field Shop)



Riken Yamamoto at the commemorative lecture event



Exhibition of 50 years of First Place designs

**Riken Yamamoto (Representative, Riken Yamamoto & Field Shop) : Fifteen years as a judge and six years as Chief Judge ending with the 50th Competition**

"It is no small accomplishment to keep an international competition going for 50 years. I believe that Central Glass has contributed to the world of architecture and, by extension, society through this competition. For whom do you create architecture? With whom do you discuss it? With whom do you develop it? Architecture is created through our relationships with others. The things we thought about as students are things we will think about for the rest of our lives; they are lifelong treasures. It is important to consider them seriously."



**Hiroshi Naito (Representative, Naito Architect & Associates) : New Chief Judge starting with the 51st Competition**

"Past Chief Judges of this competition include Togo Murano and Kenzo Tange, whom I think represent the very history of architecture. The judging panel approaches the task of judging from the perspective of creating an opportunity to foster the next young generation so that its members can go on to build a new era."



## Special Feature 2

# Overseas Initiatives

## Carlex Group

As a member of the Central Glass Group, the Carlex Group, which has its head office in Nashville, Tennessee, operates four plants in the United States and one plant in Europe.

It produces high-quality automotive glass for not only Japanese companies but also a wide range of customers in the US, Europe, and South Korea.



### Carlex Group

Items produced: fabricated automotive glass, float glass  
Number of Employees: 3,100

## ► Environmental and Safety Initiatives

In recent years, automakers have been pursuing safety and environmental initiatives such as safety and collision avoidance features, energy efficiency, and weight reduction. In order to meet these needs, the Carlex Group supplies products for head-up displays, windshields with infrared reflective coatings, products for vehicle-mounted cameras, laminated door glass, and more. The Group is also working to develop new products. As environmental measures, we consider energy-saving equipment when making capital investments for planned new installations and are working to establish and promote lead-free soldering technology in compliance with the regulations in each country.

### Initiatives in the Carlex Group

The number of employees in the Carlex Group has increased sevenfold over the last five years.

Accordingly, we established a department dedicated to the environment, health, and safety at the head office in 2015. This department is providing assistance and guidance to all sites, including in Europe.

In addition, this year we started using a management system to support safety and environmental compliance as a new initiative in North America.

## ► Message from the CEO

The Carlex Group has rapidly expanded in size in recent years, including through corporate acquisitions. Employee safety and health and environmental consideration are the basic premises under which we conduct our business. Last year, we established and launched use of environmental safety and health management system guidelines that cover the expanded business.

I believe that in order for the system to function effectively, it is important for top management to take the initiative in addressing these issues. From here on, we will make even greater efforts to reduce our environmental impact by setting targets for factors such as energy conservation, emissions, and waste reduction. I also believe that a future task for each site is to focus more on social contributions.



**Toru Ogawa**  
Chief Executive Officer

## Corporate Governance and Compliance

# Increasing the Transparency and Fairness of Overall Management

Central Glass has established a corporate governance structure to increase the transparency and fairness of its overall management and to improve efficiency and speed. We are also carrying out initiatives to raise all employees' awareness of compliance in order to practice honest corporate activities.

### ➤ Corporate Governance

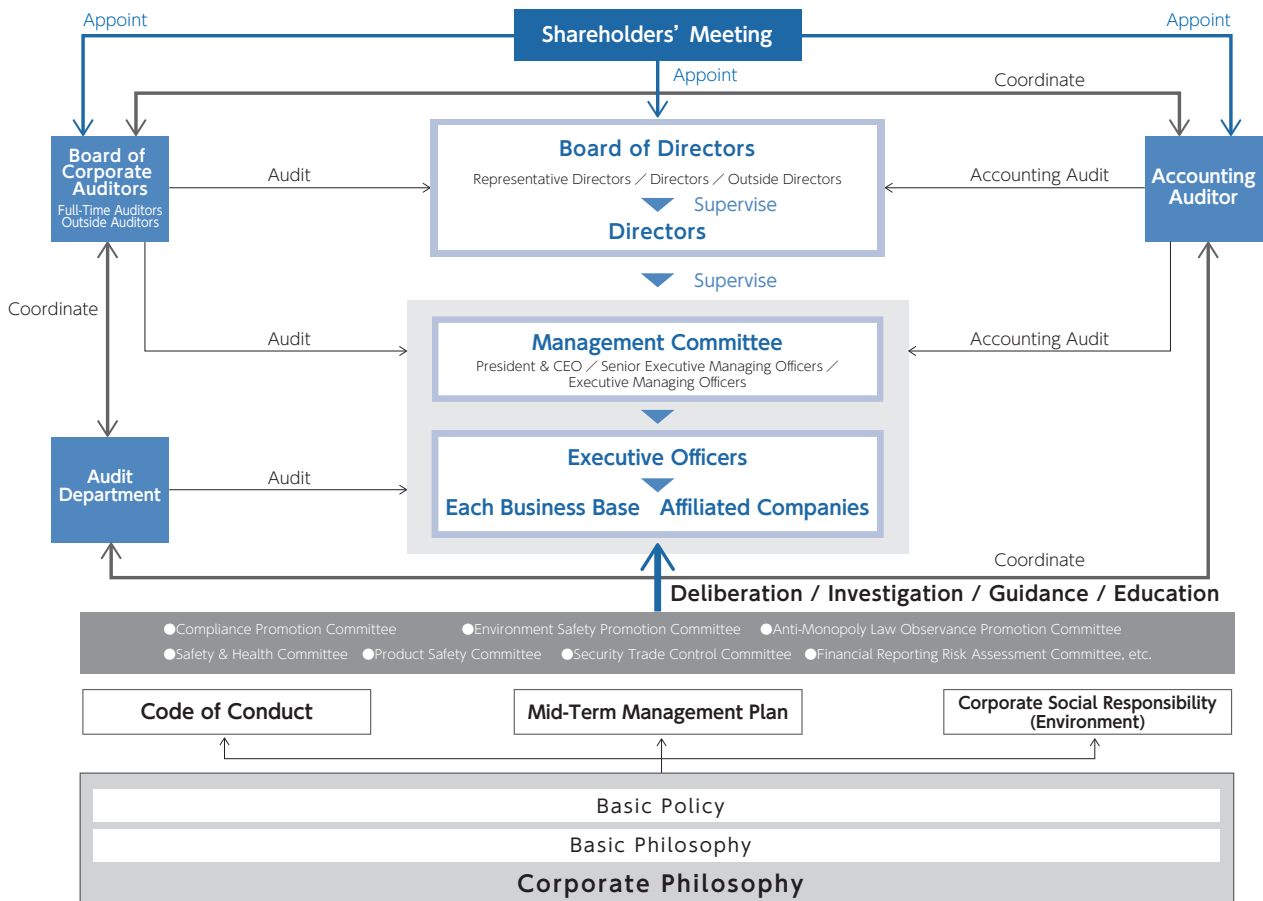
Central Glass is continually increasing the transparency and fairness of its overall management and strives to establish an efficient, rational organizational structure that can respond swiftly to changes in the business environment in order to further enhance its corporate value and expand its revenue.

### ➤ Status of Corporate Body and Internal Control System

The Board of Directors and the Board of Corporate Auditors are the foundation of Central Glass's 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. Moreover, in order to enhance auditing and supervisory functions, independent outside directors and outside auditors who pose no risk of a conflict of interest with general shareholders ensure the fairness of decisions made by the Board of Directors and play a role in eliminating arbitrary decisions by the Board of Directors. See the chart below for details of our corporate governance structure.

#### Organizational Chart for Corporate Governance



## Status of Internal Control System

| Year       | Status   |
|------------|--|
| May 2006   | The Board of Directors decides on a basic policy regarding the establishment of an internal control system stipulated in Japan's Companies Act.  |
| April 2008 | The system is partially revised with content to exclude antisocial forces.   |
| April 2009 | The system is partially revised with regard to internal information management and insider trading rules as well as an internal control system concerning financial reporting and a financial reporting risk assessment committee.   |
| April 2010 | The system is partially revised with regard to appointment of outside directors, enhancement of the internal whistleblowing system, and a compliance promotion committee.  |
| April 2012 | The system is partially revised with regard to an appropriate management system for confidential information and measures against persons from crime syndicates when making contracts.   |
| April 2014 | The Board of Directors makes partial revisions with regard to the communication of undisclosed internal information and regulation of acts that recommend trade in line with an amendment to Japan's Financial Instruments and Exchange Act, and to prevent unforeseen damages to the company and involvement in unanticipated scandals due to the spread and use of social media. |
| April 2015 | The system is partially revised with regard to the development of a system to ensure reasonable business practices in corporate groups and a system to support auditing by auditors in line with amendments to Japan's Companies Act and Ordinance for Enforcement of the Companies Act, as well as personal information protection and prevention of sexual and power harassment. |

## ► Compliance

In order to establish corporate governance\*<sup>1</sup>, it is essential to raise our awareness of compliance\*<sup>2</sup> in addition to upgrading and reinforcing our corporate governance framework. To fulfill this purpose, the Central Glass Group established the "Central Glass Group's Code of Conduct" as the internal code for conducting faithful business activities with stakeholders such as business partners, concerned organizations, customers, consumers, and employees. Every employee carries a card displaying this Code of Conduct to constantly enhance awareness of compliance. The top executives also strive to set a good example through their actions.

We also created a "Compliance Manual" to serve as a guide on dictating social norms and corporate ethics. This manual covers a wide range of fields including, among others: anti-monopoly law; independence from

antisocial forces; intellectual property rights; regulations on insider trading; environmental conservation; the workplace environment; the protection and management of information; and respect for human rights. The Central Glass Group also established and started operating a Whistle Blowing System so that all employees can obtain guidance and consult on issues.

The effective use of these systems, together with regular education through internal training seminars, helps each employee gain a deeper understanding of relevant laws and regulations and take appropriate action when conducting business. Through these activities, the Central Glass Group aims to enhance both awareness and compliance.

\* 1 Corporate governance: The way a corporation should be governed

\* 2 "Compliance" refers not only to the observance of laws and regulations in a limited sense, but also includes the observance of a wide range of social norms when conducting business activities.

In April 2014, Central Glass underwent a walk-in inspection by the Japan Fair Trade Commission (JFTC) resulting from an alleged violation of the Antimonopoly Act in the trading of polyaluminum chloride. We cooperated fully with the JFTC's investigation from that time forward. In February 2016, we received a cease-and-desist order and a surcharge payment order from the JFTC due to a violation of Article 3 (prohibition of unreasonable restraints on trade) of the Antimonopoly Act. Central Glass takes this incident with the utmost seriousness and will strive to ensure more thorough compliance to prevent recurrence.

# Promoting Management that Meets Societal Demands

The Central Glass Group undertakes voluntary management activities aimed at making improvements by taking care to ensure the environment, safety, and health and environmental protection over the total life cycle of our products, from the R&D stages through to the procurement of raw materials, production, distribution, use, and disposal. We pay meticulous attention in order to maintain, manage, and guarantee the quality of the products that we deliver to our customers, and have set in place structures for their production, transportation, and supply. We promote management that is responsive to the societal demands of every one of our stakeholders as we aspire to be a company that is truly beneficial and contributes to society.

## Mid-term Targets and FY2015 Results

Progress Accomplished: ⊙ Made steady progress: ○ Additional measures required: △

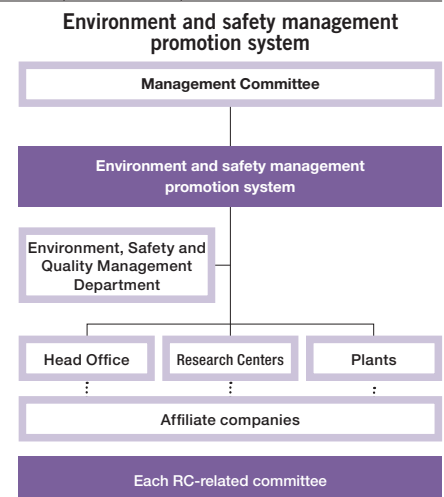
| Major Issues   | (P) Mid-Term Targets  | (D) FY2015 Results  | (C) Ratings | (A) FY2016 Plans   |
|--|---|---|-------------|--|
| Establishment & maintenance of environmental management system | ● Renew and maintain certification at main workplaces.  | The Ube Plant, Kawasaki Plant, and Matsusaka Plant (including the Sakai Manufacturing Site) maintained their ISO 14001 certification and underwent a periodic review for certification renewal.                               | ⊙           | Renew and maintain certification at main workplaces.   |
|  | ● Renew and maintain certification and promote acquisition of new certification at affiliates.<br>● Improve self-management level at affiliates that have not acquired certification. | Domestic affiliates that have already acquired certification maintained and continued their certification. During onsite audits, provided guidance on self-management to affiliates that have not yet acquired certification. | ○           | Renew and maintain certification and promote acquisition of new certification at affiliates. Improve self-management level at affiliates that have not acquired certification. |

## ➤ Environment, Safety, and Quality Management Promotion Systems

The various supervisory departments for each area form the core when it comes to promoting the environment, safety, and quality management systems at Central Glass. They coordinate with other related departments in order to follow up on the various activities at our head office, plants, research centers, and affiliate companies.

As indicated in the figure on the right, our Environment Safety Promotion Committee forms the core of our responsible care activities, while our Environment, Safety and Quality Management Department serves as the secretariat for this. They support and promote activities related to environmental and safety matters carried out by each of our departments.

- Environmental safety aspects** ..... Environment, Safety, and Quality Management Department
- Product safety aspects** ..... Glass Quality Assurance Department, Chemicals Quality Assurance Department
- Education/human resource building aspects** ..... Personnel Department
- Occupational safety and health aspects** ..... Personnel Department  
Environment, Safety, and Quality Management Department
- Social demands** ..... Corporate Administration Department



## Acquisition Status for Environmental, Safety, and Quality Management System

| Our plants and affiliate companies                                       | Environment            |          | Quality            |             | Safety |
|--|------------------------|----------|--------------------|-------------|--------|
|  | System ISO 14001, etc. | ISO 9001 | ISO/TS 16949       | OHSAS 18001 |        |
| Ube Plant  | ○                      | ○        |                    | ○           |        |
| Kawasaki Plant   | ○                      | ○        |                    |             |        |
| Matsusaka Plant (including Sakai Manufacturing Site)                     | ○                      | ○        | ○(Matsusaka Plant) |             |        |
| Central Glass Sales Co., Ltd. - Urayasu Plant                            |                        | ○        |                    |             |        |
| Central Glass Sales Co., Ltd. - Sakai Plant / Sakaide Manufacturing Site | ○(Sakai Plant)         | ○        |                    |             |        |
| Central Glass Engineering Co., Ltd.                                      |                        | ○        |                    |             |        |
| Central Chemical Co., Ltd. - Ube Plant                                   | ○                      |          |                    |             | ○      |
| Central Glass Module Co., Ltd. - Head office / Kyushu Plant              |                        |          | ○                  |             |        |
| Japan Tempered & Laminated Glass Co., Ltd.                               | ○ <sup>*1</sup>        | ○        |                    |             |        |
| Central Glass Fiber Co., Ltd. - Matsusaka Plant / Kasugai Plant          | ○(Matsusaka Plant)     | ○        |                    |             |        |
| Mie Glass Industry Co., Ltd. - Matsusaka Plant                           | ○                      | ○        |                    |             |        |
| Central Glass Plant Services Co., Ltd.                                   | ○                      |          |                    |             |        |
| Carlex Glass Company, LLC (US)   | ○                      |          | ○                  |             |        |
| Carlex Glass America, LLC (US)   | ○                      |          | ○                  |             |        |
| Carlex Glass of Indiana, Inc. (US)                                       | ○                      |          | ○                  |             |        |
| Carlex Glass Luxembourg, S.A.(Luxembourg)                                | ○                      |          | ○                  |             |        |
| Apollo Scientific Limited (UK)   | ○                      | ○        |                    |             |        |
| JCEL Co., Ltd. (South Korea)   | ○                      | ○        |                    |             |        |
| Taiwan Central Glass Co., Ltd. (Taiwan)                                  | *2                     | ○        |                    |             |        |
| Giga Gas & Electronic Materials Company (Taiwan)                         |                        | ○        |                    |             |        |
| Central Glass Chemspec Company Ltd. (China)                              | *2                     | ○        |                    |             |        |

\*Affiliates shown are those over which Central Glass has the right of control. \*Acquisition statuses for our plants and affiliates in Japan are as of March 31, 2015. \*Acquisition statuses for overseas affiliates are as of December 31, 2015.

\*1Eco-Action 21 \*2Acquisition planned for 2016

## ➤ Environment and Safety Audits

Central Glass carries out environment and safety audits every year focusing on our plants, research centers, and domestic affiliate companies. Central Glass's audits are conducted in two stages: a self-audit in which all targeted workplaces use a checklist to check the status of their RC activities, and an onsite audit in which the Environment Safety Department checks workplaces, selected based on the self-audit results, through direct visits.

In FY2015, onsite audits were carried out at 16 of our workplaces, and we also instituted site visits, documentation checks, and hearings on matters of concern and important issues. During onsite audits, we verify whether RC activities are being implemented appropriately and perform detailed checks including confirming environmental compliance and conducting safety risk assessments. This helps improve initiatives at each of our workplaces.

Furthermore, in fiscal 2015, we began environment and safety audits at overseas affiliates. In fiscal 2015, we conducted audits of four of the 13 targeted companies. We plan to audit all the companies in order on a three-year cycle.



Environment and safety onsite audit  
(Central Glass Fiber Co., Ltd. Kasugai Plant)



AED training (Glass Research Center)

## Education and Training for Environmental and Safety Aspects

Under the recognition that "all of our employees are talented individuals and treasures to the company", each of the workplaces in the Central Glass Group focuses its efforts on education and training. Education and training are indispensable to deepening the understanding of every one of our employees regarding CSR and the environment as members of society, as well as to acting in a responsible manner or minimizing damage when disasters occur. We offer education and training at each workplace in a timely manner by choosing themes that are suited to the timing of implementation and targeted employees, with the goal of raising their awareness of such environmental, safety, and other issues.

In FY2015 we carried out disaster drills and provided education related to the environment and safety at many of our workplaces on several occasions.

At the Matsusaka Plant, we provided education on our environmental management system to all employees in the office and within the ISO 14001 site (about 1,000 people). In order to solve environmental issues, each and every employee must take an interest in and understand environmental issues and take conscious action.

A partial list of the education/trainings related to the environment, safety, and other issues offered at our head office, research centers, plants, and affiliate companies in fiscal 2015 is shown in the table below.

### Examples of environmental education and training held in FY2015

| Workplace                                  | Overview of education and training  | Targeted persons   | Dates held                    | Number of attendees  |
|--|---|--|-------------------------------|----------------------|
| Head Office                                | Simulated AED training & cardiac massage using a manikin  | Employees of all head office departments and affiliates    | June<br>November 2015         | 44people             |
| Chemical Research Center (Tokyo)           | Company training on risk assessment of chemical substances (lecture by an outside speaker and practice) | Center staff   | January 2016                  | 34people             |
| Chemical Research Center (Ube)             | SDS, Yellow Card, and MSDSplus guidance   | Center staff   | June 2015                     | 57people             |
| Glass Research Center                      | Simulated AED training & cardiac massage using a manikin  | Employees  | February 2016                 | 50people             |
| Ube Plant                                  | Law study session: "Disposal of industrial waste (mercury and low-concentration PCBs)"                  | Employees of the Ube Plant and affiliates                  | November 2015                 | 65people             |
| Matsusaka Plant                            | ISO 14001 environmental education   | All employees within the ISO 14001 site                    | Different for each department | Approx. 1,000 people |
| Matsusaka Plant - Sakai Manufacturing Site | Comprehensive disaster-preparedness drill   | Employees on the premises of the Sakai Mfg. Site           | September 2015                | 63people             |
| Kawasaki Plant                             | Education on heatstroke countermeasures   | Representatives of each section and cooperating workplaces | June 2015                     | 58people             |
| Central Glass Plant Services Co., Ltd.     | Hands-on training using various danger-sensing devices  | All employees of Central Glass Plant Services Co., Ltd.    | Year-round                    | 209people            |
| Central Glass Sale Co., Ltd. Rifu Plant    | Lessons on past accident case studies   | All onsite workers   | September 2015                | 29people             |



## ► Environmental Accounting

We calculate the environmental costs related to our environmental preservation initiatives for air, water, soil, and disposal of waste at Central Glass and our main affiliates in Japan. Our capital investments with environmental impacts include steam, electricity, and waste disposal. The investment amount decreased from the previous year, as there were fewer large capital investments.

The amount of expenses also decreased as a result of a decline in expenses such as air and water measures and waste disposal accompanying the shutdown of soda ash production at the Ube Plant.

In the future we, along with our affiliate companies, will continue to use our capital investments and environmental preservation spending to promote environmental preservation measures.

### Environmental Preservation Costs

(Unit: million yen)

| Category   | Major initiatives  | FY2014      |              | FY2015      |              |
|--|--|-------------|--------------|-------------|--------------|
|  |  | Investments | Expenses     | Investments | Expenses     |
| <b>(1) Business area costs</b>                       |  |             |              |             |              |
| <b>Pollution prevention costs</b>                    | Preventing the pollution of the air, water, soil, etc.                             | 119         | 1,949        | 186         | 1,685        |
| <b>Global environmental preservation costs</b>       | Preventing global warming, measures to conserve energy, etc.                       | 656         | 96           | 520         | 177          |
| <b>Resource recycling costs</b>                      | Waste disposal, recycling treatment, etc.  | 84          | 1,508        | 5           | 1,465        |
| <b>(2) Upstream/downstream costs</b>                 | Collection, recycling, and appropriate disposal of products, etc.                  | 0           | 0            | 0           | 0            |
| <b>(3) Cost of management activities</b>             | Maintaining the EMS, environmental monitoring, environmental education costs, etc. | 0           | 244          | 3           | 230          |
| <b>(4) Cost of R&amp;D activities</b>                | R&D of products involved in environmental preservation                             | 20          | 539          | 6           | 449          |
| <b>(5) Cost of social activities</b>                 | Improving the environment, contributing to local communities, etc.                 | 0           | 2            | 0           | 3            |
| <b>(6) Cost of dealing with environmental damage</b> | Restoring the environment, environmental preservation compensation, etc.           | 0           | 0            | 0           | 0            |
|  | <b>Total</b>   | <b>879</b>  | <b>4,338</b> | <b>720</b>  | <b>4,008</b> |

## ► 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.

A huge amount of heat energy is needed to melt raw materials

in the glass business, so its central issue is measures to prevent global warming. The development of environmentally friendly products and reducing waste are the central issues of the chemicals business, and sustained efforts are being made toward energy saving activities and to establish recycling systems.

### INPUT

| Total amount of materials input 935,000tons |                     | Amount of water resources input 21.474 million m <sup>3</sup> |                              | Amount of net energy input 12,111TJ* |                     |
|---|---------------------|---|------------------------------|--------------------------------------|---------------------|
| Central Glass                               | Affiliate companies | Central Glass   | Affiliate companies          | Central Glass                        | Affiliate companies |
| 488,000tons                                 | 447,000tons         | 12.279 million m <sup>3</sup>                                 | 9.195 million m <sup>3</sup> | 6,855TJ                              | 5,256TJ             |

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



### OUTPUT

| Atmosphere  |                          | Water   |                             | Waste                                      |                     |
|---|--------------------------|---|-----------------------------|--|---------------------|
| Emissions of greenhouse gases 717,000 t-CO <sub>2</sub>       |                          | Net amount of discharged water 17.045million m <sup>3</sup> |                             | Net emissions of waste 116,000 tons        |                     |
| Central Glass   | Affiliate companies      | Central Glass   | Affiliate companies         | Central Glass                              | Affiliate companies |
| 488,000t-CO <sub>2</sub>                                      | 226,000t-CO <sub>2</sub> | 9.885 million m <sup>3</sup>                                | 7.160million m <sup>3</sup> | 49,000 tons                                | 67,000 tons         |
| Emissions of substances that damage the atmosphere 3,942 tons |                          | Emissions of substances that affect water quality 93 tons   |                             | Final amount of waste disposed 24,000 tons |                     |
| Central Glass   | Affiliate companies      | Central Glass   | Affiliate companies         | Central Glass                              | Affiliate companies |
| 3,787tons   | 155 tons                 | 74tons  | 19tons                      | 18,000tons                                 | 6,000tons           |

Recycling rate for waste 79%

| Central Glass | Affiliate companies |
|---------------|---------------------|
| 63%           | 91%                 |

#### Reporting range

- Central Glass: Three plants, one manufacturing site, three research centers, and the head office
- Affiliate companies: 7 major domestic manufacturing companies and 11 major overseas companies

## Safety

# Taking Industrial Safety and Health, Security and Disaster Prevention, and Safety of Chemical Substances as Our Most Important Challenges

The Central Glass Group recognizes industrial safety and health, security and disaster prevention, and safety of chemical substances as the most important challenges in our corporate activities and promotes initiatives for each of them.

### Mid-term Targets and Fiscal 2015 Results

Progress Accomplished: ⊙ Made steady progress: ○ Additional measures required: △

| Major Issues                     | 〈P〉 Mid-Term Targets   | 〈D〉 FY2015 Results   | 〈C〉 Ratings | 〈A〉 FY2016 Plans  |
|----------------------------------|--|--|-------------|---|
| Industrial health and safety     | <ul style="list-style-type: none"> <li>● No injuries causing lost work hours (try various timely measures)</li> </ul>  | Among all our Group companies in Japan including affiliates, there were nine accidents resulting in lost work hours, which was one more than the previous year. The number of such accidents has mostly bottomed out since 2009. The total number of accidents, including those that did not result in lost work hours, was down 25% from the previous year.                                     | △           | Implement proactive measures against accidents based on the analytical results of annual reports on Group-wide industrial accidents (eliminate potential hazards through risk assessment and KY, etc.) and hold safety training workshops aimed at implementing sound measures to prevent recurrence. |
|                                  | <ul style="list-style-type: none"> <li>● Enhance risk management for industrial health and safety</li> </ul>   | Continue to maintain OHSAS18001 certification at our Ube Plant. Continued efforts toward establishment of risk management systems at our Matsusaka and Kawasaki Plants.  | ○           | Maintain and continue management system and cross-deploy it to other workplaces.  |
| Security and disaster prevention | <ul style="list-style-type: none"> <li>● Conduct voluntary safety audits on high-pressure gas by management</li> <li>● Enhance preventative measures against disasters</li> </ul>  | Periodic inspections were carried out by administrators at our Ube, Kawasaki, and Matsusaka Plants and Sakai Manufacturing Site. Voluntary safety audits on high-pressure gas were conducted. The state of management at workplaces with elevators, including statutory inspections, was confirmed for all group companies in Japan, including affiliates.                                       | ○           | Continue to comply with laws and pass on safety techniques and know-how. Efforts toward establishing equipment safety measures.   |
| Chemical and product safety      | <ul style="list-style-type: none"> <li>● Implement appropriate management of chemical substances</li> </ul>  | Compliance with the Act on the Evaluation of Chemical Substances, 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, and provision of information to the concerned parties (requiring various submissions). Sequentially improved SDS and labeling. | ⊙           | Continue compliance with laws & regulations and revision of our SDS and labeling.   |
|                                  | <ul style="list-style-type: none"> <li>● Promote alternatives to or detoxification of environmental impact substances                             <ul style="list-style-type: none"> <li>•Asbestos</li> <li>•PCBs</li> <li>•Other environmental impact substances</li> </ul> </li> </ul> | Removed and treated non-scattering asbestos-containing materials from manufacturing facilities when upgrades were made. Affiliates in the Chubu and Kinki regions completed final disposal of high-concentration PCB machinery. All plants and affiliates sequentially began final disposal of low-concentration PCB machinery.  | ○           | Continued removal of asbestos used at workplaces when upgrades are made. Continued strict management of machinery containing PCBs and their disposal according to local administrative guidance.  |
|                                  | <Promotion of Green Procurement> <ul style="list-style-type: none"> <li>● Implement audits on chemical substances</li> <li>● Provide information to customers promptly</li> </ul>  | Each Group company in Japan, including affiliates, confirmed chemical substance management (compliance with laws) and customer response status using an environmental safety self-checklist.   | ○           | Efforts to reduce the environmental impact of products by enhancing management of our database of information and to provide reliable and prompt information to our customers.  |

## ➤ Industrial Safety and Health

The Central Glass Group recognizes that maintaining a safe working environment is a basic requirement for all business operations. Accordingly, we carry out industrial safety and health activities at all of our workplaces, including affiliates.

In 2015, we have carried on with activities based around the mainstay of our Policies on Safety and Health, which include items such as “thoroughly ensure neat and tidy workplaces” and “enhance education and training on safety and health.” In addition, we called attention to safety measures by holding the “Summertime Industrial Accident Prevention Campaign,” as well as by issuing a white paper on “Industrial Accidents” and awarded “Safe Operation Awards” to further motivate awareness of industrial safety.

In 2015, among all our Group companies in Japan including affiliates, there were nine accidents resulting in lost work hours, which was one more than the previous year. The number of such accidents has bottomed out at around 10 per year

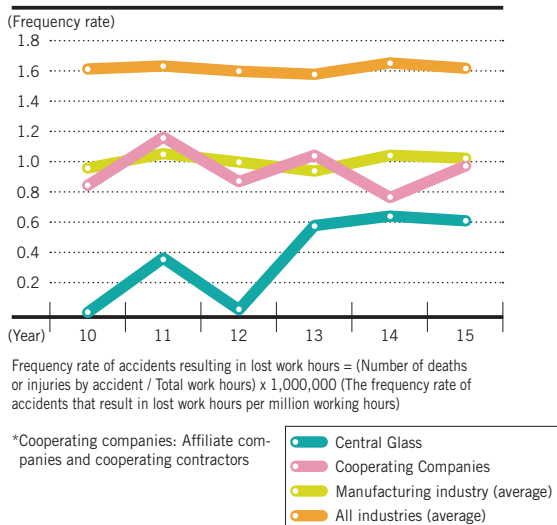
since 2009.

To make further improvements in the future, it is essential that we eliminate latent dangers through risk assessments and thoroughly implement measures to prevent the recurrence of similar accidents.

Compared to 2014, the rate of accidents resulting in lost work hours (see the next page) improved at Central Glass but worsened at cooperating companies. Both, however, were below the averages for all industries and the manufacturing industry.

We will continue to make efforts to reduce the occurrence of accidents, including through such initiatives, in the future.

### Frequency rate of accidents resulting in lost work hours



### <2015 Policies on Safety and Health—Priority Implementation Items>

1. Ensure workplaces are kept tidy and in order (remove unsafe conditions).
2. Reinforce safety and health education and training (prevent similar accidents).
3. Review basic operation manuals and ensure thorough compliance with them.
4. Establish a system for industrial safety and health management (risk assessments)
5. Promote healthcare, the maintenance of health, and mental healthcare
6. Prevent traffic accidents during everyday driving as well as commutes.
7. Further improve the emergency reporting system and ensure thorough compliance with it.

## ➤ Security and Disaster Prevention

Since most major plants of Central Glass are located in areas designated according to 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 authorities concerned with the environment, security, and disaster prevention as we aim to completely eliminate facility disasters.

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

We carry out drills at our plants and workplaces that simulate various different disasters and abnormal conditions in the aim of raising our level of disaster preparedness with our employees and the employees of each plant’s contractors.

Moreover, each business division is moving forward with the formulation of a business continuity plan (BCP) to allow us to continue or resume operations as quickly as possible in the event that operations are temporarily impacted by a disaster such as an earthquake.

We will continue with such activities in the future with safety as our highest priority.



Disaster prevention drill (Kawasaki Plant)

## ➤ Logistical Safety

Central Glass and its domestic affiliate companies implement periodic training and education for not only their employees but also employees at the workplaces to which they consign transporting. This is done to prevent accidents during the transportation of chemical substances and to minimize the damage if accidents occur. For example, at our Ube Plant, when drivers are appointed to transport things like high-pressure gases, they are given instruction by transportation managers. Furthermore, our domestic affiliate companies that handle chemical logistics provide education via SDS at monthly safety meetings and other such occasions.

When chemical substances are to be transported by road, we prepare emergency contact cards (yellow cards) for drivers which they carry not only when obligated by law, such as in the transportation of high-pressure gases and poisonous substances, but also in the

transportation of other chemical substances. On the cards, measures to be taken to minimize damage and details to be reported are clarified 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.

## ➤ Safety of Chemical Substances

The regulations on chemical substances in countries 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 lead to the minimization of significant adverse effects on human health and the environment." Such regula-

### Management of Chemical Substances

Central Glass has been surveying, aggregating, and reporting PRTR\* data voluntarily since 1995, prior to the enactment of the Chemical Substances Management Act (2000), in an effort to reduce emissions of chemical substances into the environment. The number of substances subject to notification in FY2015 at Central Glass and its domestic affiliate companies increased by four substances compared with the previous fiscal year to 60 substances (results for each of Central Glass's plants are given in the section "Activities at Plants" at the end of the report). What is more, we will continue to comply with laws and regulations such as the revised Industrial Health and Safety Act issued in 2014 and taking effect in June 2016, as well as the Poisonous and Deleterious Substances Control Act and High Pressure Gas Safety Act, in order to further enhance our measures to ensure the safety and health of workers. Our affiliate companies in both Japan and overseas work to get a grasp of local laws and the chemical substances they handle in an effort to promote the management of chemical substances from a global perspective.

We will continue working to properly manage chemical substances.

\* PRTR: Pollutant Release and Transfer Register

### Handling Asbestos

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 manage them appropriately. Components used for such applications as insulation or packing for piping in production facilities are being removed one by one as facilities are upgraded. Moving forward, we will continue to comply with laws and ordinances and promote appropriate measures for this.

### Management of PCB Machinery

Central Glass and our affiliates in Japan rigorously store and manage and properly dispose of waste condensers and other equipment containing PCBs (polychlorinated biphenyls) in compliance with Japan's Waste Management and Public Cleansing Act and Act on Special Measures concerning Promotion of Proper Treatment of PCB Waste. In fiscal 2015, the Matsusaka Plant and some affiliate companies disposed of their PCB waste.

tions include Europe's REACH regulations and Japan's revised Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc. Furthermore, in recent years revisions to laws on chemical substances have been pushed forward in Asian countries, and we must continue to comply with these in the proper manner. Against this background, the Central Glass Group is working to ensure safety through a variety of different initiatives at every stage in which chemical substances are handled.

### SDS and Labeling

Central Glass and our domestic affiliate companies strive to provide information through SDS\*<sup>1</sup> that conform to GHS.\*<sup>2</sup> When handling chemical substances and the like, measures necessary for risk abatement can be taken based on the information listed in the SDS, which is conducive to protecting safety and the environment. In addition, in an effort to manage safety, we strive to ensure that employees are thoroughly familiar with the SDS for not only our products but also for purchased raw materials.

In addition, to address the provision of information through the labeling of containers and packaging in conformity with GHS, we made preparations for reliable implementation in anticipation of the amended Industrial Safety and Health Act that came into effect in June 2016. These SDS and labels are included in a company database that is used to share safety information.

\*<sup>1</sup> 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.

\*<sup>2</sup> GHS: The Globally Harmonized System of Classification and Labeling of Chemicals

### Initiatives for Green Procurement

Central Glass is promoting the following initiatives across the entire company in order to proactively advance "green procurement." Green procurement gives priority to procuring raw materials and materials that have less of an impact on the environment when obtaining such goods.

Nowadays, as a result of moves like the enactment of Europe's REACH regulations and the revised Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc., thoroughly ensuring the management of chemical substances throughout the entire supply chain and sharing information related to the chemical substances contained in products have grown increasingly important. Through these initiatives, we will promote the reliable management of chemical substances and accommodate requests for the public disclosure of information.

- ◆ Select environmentally conscious raw materials from the R&D through to the trial manufacturing stages
- ◆ Manage raw materials based on the "Green Procurement Guidelines"
  - Confirm the environmental management systems of our suppliers
  - Confirm whether or not substances that we have voluntarily chosen to restrict are contained within the raw materials we purchase
- ◆ Prevent the intermixing of environmental impact substances through appropriate process management
- ◆ Manage products (management of packaging materials and confirmation that targeted chemical substances are not contained within products)
- ◆ Share information among the concerned parties through the creation and use of a "Green Procurement Database"
- ◆ Provide education for the persons in charge of the relevant departments

## Environment

# To Enrich Society by Ensuring the Protection of the Global Environment and the Health and Safety of People

The Central Glass Group will strive to realize a rich society through measures that ensure the protection of the global environment and the health and safety of people in all of our activities ranging from the R&D stages to the purchasing of raw materials, manufacturing, distribution, use, disposal, and all other stages in the life cycle of our products.

### Mid-term Targets and FY2015 Results

Progress Accomplished: ⊙ Made steady progress: ○ Additional measures required: △

| Major Issues  | ⟨P⟩ Mid-Term Targets  | ⟨D⟩ FY2015 Results  | ⟨C⟩ Ratings | ⟨A⟩ FY2016 Plans  |
|---|---|---|-------------|---|
| Prevention of global warming (energy and resource conservation) | <FY2020 Target><br>● Reduce FY2020 CO <sub>2</sub> emissions by 15% relative to FY2005. | CO <sub>2</sub> emissions totaled 488,000 tons, down 48% from FY2005.                             | ⊙           | Continue working toward the FY2020 target of a 15% reduction in CO <sub>2</sub> emissions relative to FY2005. |
| Reduction of waste  | <FY2015 Target><br>● Reduce final landfill disposal volume by 65% relative to FY2000.   | Final disposal volumes at our main plants were down 74% from FY2000, achieving our FY2015 target. | ⊙           | Set a FY2020 target for reduction in final disposal volumes.  |

### ➤ Our Efforts to Prevent Global Warming

The Central Glass Group strives to reduce emissions of greenhouse gases into the atmosphere through the manufacturing and shipper's transportation of goods in order to prevent global warming.

#### Central Glass

Central Glass has set and is working toward a target of reducing the greenhouse gases given off by the use of fuel, purchased power, and raw materials for manufacturing by 15% relative to 2005 levels by 2020, with this serving as a mid-term initiative to prevent global warming.

For FY2015 we reduced this by 48% relative to FY2005. Emissions of greenhouse gases fell from the fiscal 2014 level as energy usage declined due to a reduction in equipment resulting from a halt in production of soda ash at the Ube Plant.

Greenhouse gas emissions resulting from transportation of products and other cargo by truck, ship, rail, etc. decreased from the previous fiscal year. Nevertheless, we will continue to streamline our energy use in transportation.

#### Central Glass Group

Emissions of greenhouse gases for the Central Glass Group fell substantially from the previous year as the result of a change in operations at the Ube Plant. The number of overseas production sites included was increased, resulting in an increase in emissions outside Japan.

#### Number of reports of GHG emissions from overseas manufacturing sites

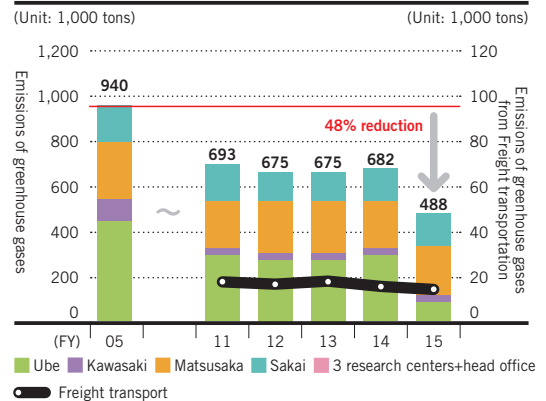
2011: 7 companies 2012–2013: 8 companies 2014: 10 companies

2015: 11 companies

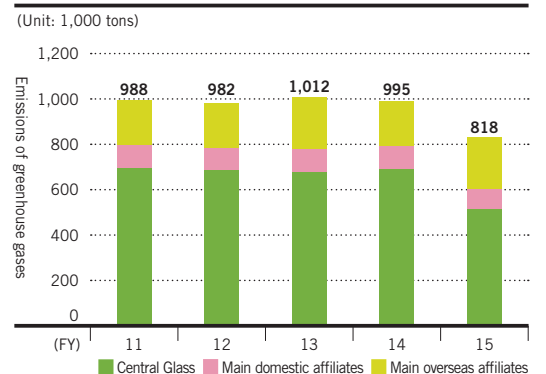
Each workplace is reducing emissions of greenhouse gases through energy saving initiatives, updating of equipment, and other measures to prevent global warming.

The Central Glass Group will continue working to reduce greenhouse gas emissions in order to help prevent global warming.

#### Central Glass's emissions of greenhouse gases



#### Central Glass Group's emissions of greenhouse gases

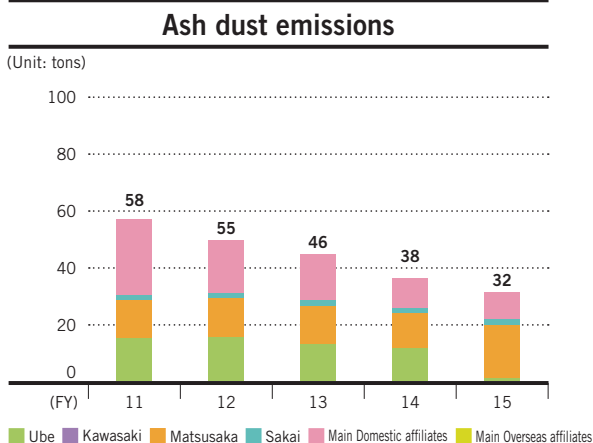
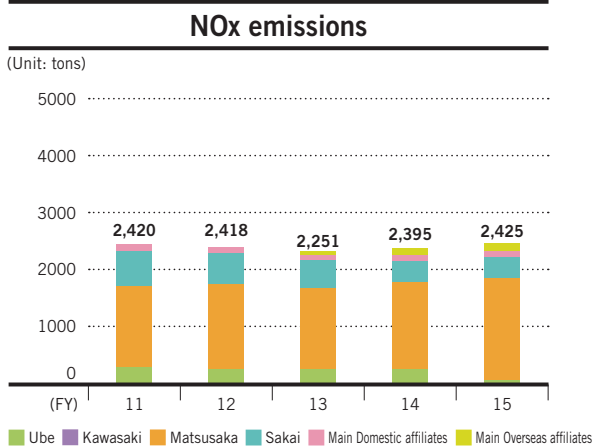
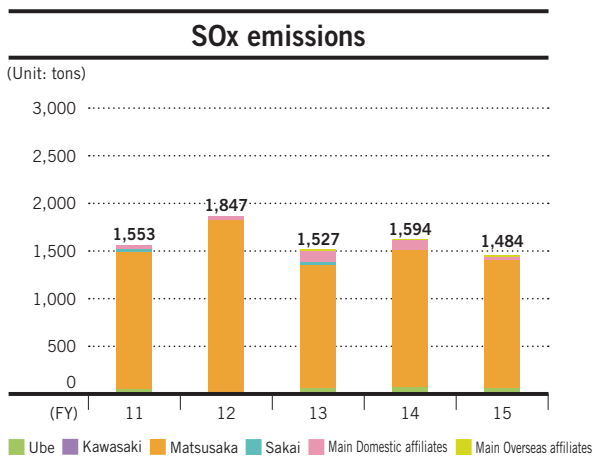


## ➤ Reducing Environmental Impact Substances

When it comes to Central Glass Group's manufacturing sites, our plants are operated in compliance with emissions standards for the atmosphere and water quality in the area. Reducing environmental impact substances is an important challenge in consideration of the global environment and human health and safety, and so for the future we will continue to undertake appropriate management for this.

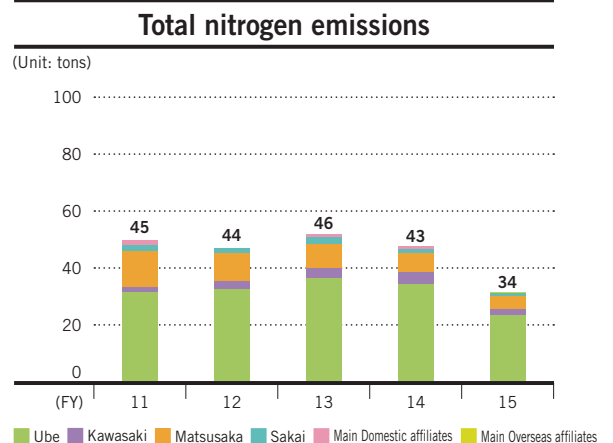
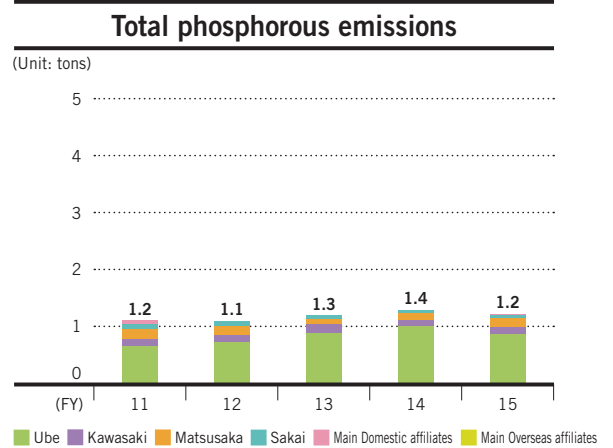
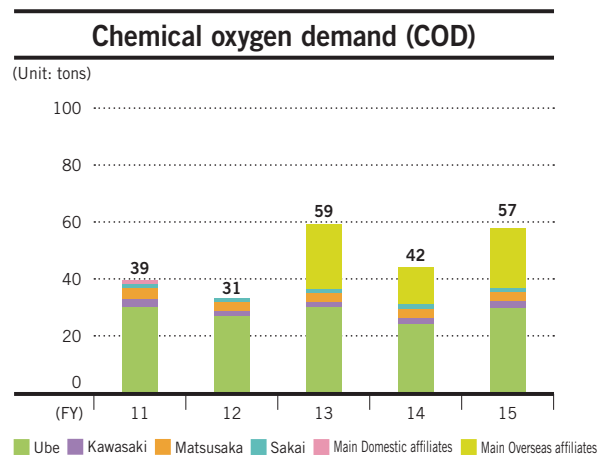
### Countermeasures Against Substances that Damage the Atmosphere

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



### Countermeasures Against Substances that Affect Water Quality

Of the substances that affect water quality, trends in our chemical oxygen demand (COD) and total emissions of both phosphorous and nitrogen are shown below.



\* Tabulation of emissions of environmental impact substances at overseas affiliates began in FY2013.

## ➤ Initiatives to Reduce Industrial Waste

In line with the spirit of the 3Rs (reduce, reuse, and recycle), the Central Glass Group is striving to reduce industrial waste.

### Central Glass

Central Glass's plants uphold "promoting reduction and re-use/recycling of industrial waste" as an important task in our responsible care activities, and each workplace carries out initiatives accordingly.

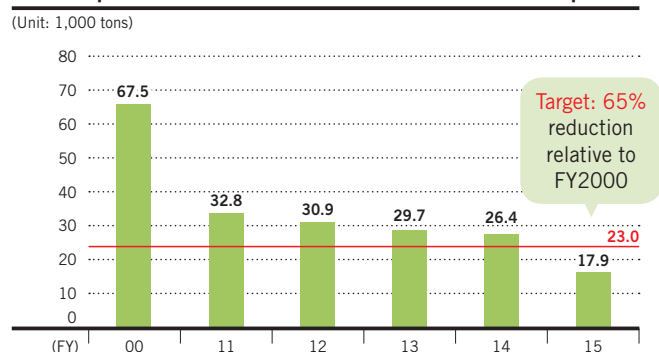
Thus far, we have worked toward the target of a 65% reduction from the fiscal 2000 level by fiscal 2015. The amount of industrial waste (final disposal volume) in fiscal 2015 came to approximately 17,900 tons, a 74% reduction from fiscal 2000. We therefore achieved our initial goal.

We have been striving toward achievement of our goal by making steady efforts to practice reuse and recycling at each plant.

As an initiative to reuse resources, the chemicals division achieved efficient use of resources by developing a technology to recover fluorine in its fluorine form from the fluorine-containing wastewater emitted during our manufacturing processes. Fluorite is the main ingredient in fluorine compounds. In recycling initiatives, our glass division is working to switch to disposal companies that recycle the sludge waste generated by our plants into roadbed material instead of disposing of it at landfills.

(Government target: 70% reduction in the final disposed amount of industrial waste in fiscal 2020 compared to fiscal 2000)

#### Final disposed amount of industrial waste (Central Glass' plants)



## ➤ Green Procurement

Central Glass and our domestic affiliate companies enacted "Green Procurement Guidelines" in 2006, and have begun giving priority to purchasing products and services from suppliers that strive to reduce their environmental impact.

In March 2014, we revised the "Green Procurement Guidelines" for Central Glass and our affiliate companies in Japan in consideration of cases in which judgments could not easily be made as well as variance in the judgment criteria. As of

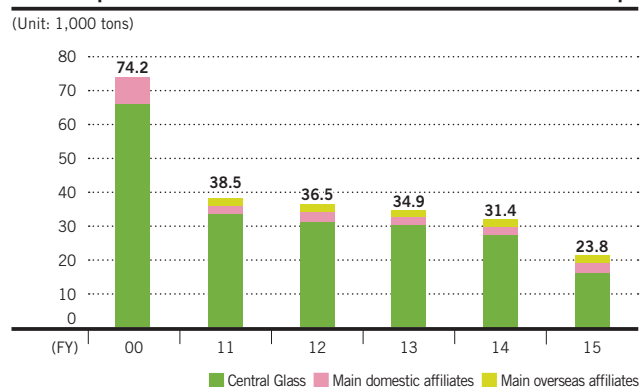
### Central Glass Group

As a waste-emitting company, Central Glass, along with its domestic affiliates, unfailingly complies with Japan's Wastes Disposal and Public Cleansing Act and other relevant laws when it comes to the sorting and storage of waste, as well as consignment, monitoring, and manifest management for proper disposal by industrial waste disposers.

Each of the Central Glass Group's major domestic affiliate companies carries out its own original reduction measures, and as a result, on the whole, our major domestic affiliate companies have roughly halved their amount of waste (final amount disposed) in recent years relative to FY2000 levels.

We began tabulating the amount of waste at overseas affiliates in FY2006 and continued to follow up with them in FY2015. Each individual company is carrying out efforts to reduce its waste. In particular, our glass plants deployed overseas have been working to reuse nearly 100% of their glass, just like our domestic plants.

#### Final disposed amount of industrial waste (Central Glass Group)



fiscal 2014, we clarified the judgment criteria and narrowed down the targeted items in order to allow for new green procurement efforts. We are forging ahead with these efforts throughout the Central Glass Group.

Our fiscal 2015 results at Central Glass were 83% on a monetary basis. We will gradually deploy green procurement at affiliates where initiatives have not yet been implemented.

## Quality

# To Provide Products and Services That Our Customers Can Use With Peace of Mind

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*. Not only do we comply with laws and regulations, we also ensure product safety and accurately determine customer requirements in an effort to provide products and services that our customers love and can use with peace of mind.

### Basic Quality Policy

We aspire to truly contribute to society with the environment, safety, and quality as our fundamentals. We always place customer satisfaction first and provide 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. We listen to customers and respond promptly.
2. Our basic approach is to build quality into processes and improve quality continually.
3. We provide customers with appropriate information regarding quality and features.

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 workplace and affiliates in Japan and abroad. Each worksite 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 validity 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.

We have developed an organizational structure that allows us to take practical action on quality assurance for glass and chemicals products respectively by separating corporate

functions for both glass and chemicals. Our objectives in this are to establish quality assurance systems suited to the different businesses of glass and chemicals products and to enhance the functioning of those systems.

### FY2015 Quality Policy

1. Improve the level of quality control.
2. Enhance efforts to reduce risk at the design and development stage.
3. Reduce the recurrence of quality complaints.
4. Ensure compliance.

### Targets and Progress

Progress Accomplished: ◎ Made steady progress: ○ Additional measures required: △

| Major Issues          | ⟨P⟩Mid-Term Targets   | ⟨D⟩FY2015 Results   | ⟨C⟩Rating | ⟨A⟩FY2016 Plans   |
|-----------------------|---|---|-----------|---|
| Customer satisfaction | ● Improve the level of quality control.                               | Conducted quality control audits based on ISO 9001 standards or ISO/TS 16949 standards at each workplace and affiliated manufacturing site, checked quality control systems, and provided support for improvement and guidance. | ○         | Continue efforts to maintain and improve quality control systems based on quality audits at each workplace and affiliate.                         |
|                       | ● Enhance efforts to reduce risk at the design and development stage. | Reduced risk early on through feasibility decisions (gate meetings) and design reviews (DR) in R&D.   | ○         | Continue efforts to reduce risk at the design and development stage through feasibility decisions (gate meetings) and design reviews (DR) in R&D. |
|                       | ● Reduce the recurrence of quality complaints.                        | Taught "5 Whys Analysis" as a means of preventing recurrence of defective quality at a pace of once per year in the glass and chemicals businesses respectively.  | ◎         | Continue efforts to reduce complaints by teaching techniques to analyze the causes of defective quality.  |
|                       | ● Ensure compliance.  | Confirmed conformity with public standards for products at each workplace and affiliate.  | ◎         | Continue efforts to confirm the status of conformity with public standards for products at each workplace and affiliate.                          |



## ➤ Quality Education and Awareness-Building

Central Glass and our affiliates in Japan have been encouraging employees to take Quality Management and Quality Control (QM/QC) Exams since 2007 in an effort to promote the acquisition of knowledge related to quality management and improvement. Each workplace and affiliate in Japan is continuously working on this initiative. Additionally,



Rank-based education (quality control)



Rank-based education ("5 Whys Analysis")

Central Glass became a sponsor of the Japanese Standards Association's QM/QC Exam in 2016.

We provide "5 Whys Analysis" education to the quality and manufacturing divisions as well as the research and sales divisions as a means of preventing the recurrence of defective quality.

We also educate the sales division on quality and product safety and train the research and manufacturing divisions in the preparation of safety data sheets (SDS).

Through these efforts, we have raised quality awareness among all employees and applied quality-related knowledge and techniques to quality activities, helping us carry out better "Monozukuri".

Furthermore, in raising quality awareness among all employees and applying quality-related knowledge and techniques to quality activities, we are continuously providing rank-based education to carry out better "Monozukuri".

## ➤ 33rd Company-Wide QC Circle Rally

We held the 33rd Company-Wide QC Circle Rally on Friday, November 20, 2015.

The number of circles that took part in the 33rd rally was 11 in total. These consisted of five circles from our plants' manufacturing divisions, four from affiliates in Japan, and two from overseas affiliated companies.

There were presentations by each circle on various proposals and measures for cutting costs, as well as the outcomes of their efforts over the past year. There was also a lively question and answer session between judges and attendees.

With participation from overseas affiliates beginning last fiscal year, our QC circle activities reflecting globalization are gaining in momentum.

As the circles try to improve through friendly competition with each other, they pursue "the creation of a better future through *Monozukuri*", which is the Central Glass Group's corporate philosophy.



Giving a presentation



Awards Ceremony

### Circles Participated in the 33rd Company-Wide QC Circle Rally (in order of presentations)

| Affiliation                   | Circle Name            |
|-------------------------------|------------------------|
| Kawasaki Plant                | B-ST                   |
| Kawasaki Plant                | Rewrite                |
| Ube Plant                     | Synthesis B            |
| Ube Plant                     | Trendy                 |
| Central Chemical Co., Ltd.    | Yayoikai               |
| Central Glass Fiber Co., Ltd. | Omiki                  |
| Matsusaka Plant               | Challenger             |
| Mie Glass Industry Co., Ltd.  | Pulsar                 |
| Mie Glass Industry Co., Ltd.  | Truck                  |
| Carlex Glass Company, LLC     | Gas Hearth Improvement |
| Carlex Glass Luxembourg, S.A. | Tempering Soldering    |



## Employees

# Making Things (*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.

### ➤ Initiatives to Develop Globally Competent Human Resources

Amid intensifying international competition, Central Glass plans to boost its expansion into global markets including increasing its overseas bases. Overseas business is increasing as a percentage of our overall business, necessitating the development of job performance skills that include sensitivity to different cultures and values in addition to language abilities. Central Glass has prepared a variety of educational programs to develop globally competent human resources who can handle this kind of environment.

### Study Abroad Programs

We send several employees to MBA programs in Japan and abroad to foster candidates for high-level managerial positions who will be responsible for the future development of Central Glass. We also send technical employees to MOT programs to develop human resources well-versed in both technology and management who are capable of furthering strategic research and technical development and can help boost our corporate value.

We also provide a short-term study abroad program to improve practical foreign language abilities and foster international awareness.

#### Number of participants on study abroad programs

| FY   | Number of MBA/MOT students dispatched | Number of short-term study abroad program students and destinations |
|------|---------------------------------------|---|
| 2011 | 2                                     | 2 (USA: 2)  |
| 2012 | 4                                     | 2 (USA: 1, China: 1)  |
| 2013 | 4                                     | 2 (Canada: 1, India: 1)   |
| 2014 | 2                                     | 2 (Canada: 1, China: 1)   |
| 2015 | 4                                     | 2 (USA: 2)  |

### Overseas Job Training Program

We systematically send young employees to overseas affiliates to gain experience working and living abroad in order to prepare them for overseas assignments in the future. During this period, which lasts about one year, they learn about operations and management methods at overseas affiliates through practical duties. Through interaction with local employees and daily life, they experience foreign ways of life and events, and learn how to become human resources who can adjust smoothly to overseas assignments.



Overseas job training

### English Conversation Lessons by Interns

We started accepting interns from overseas in fiscal 2012 in an effort to promote employees’ awareness of diversity and improve communication skills with people from other countries. In addition to their regular duties, interns spend one to two hours per day providing English instruction to our employees. Communicating in this way allows our employees to improve their English abilities and knowledge of foreign cultures while interns learn Japanese and Japanese culture.

#### Number of interns accepted

| FY   | Number of interns | Nationality of intern(s) |
|------|-------------------|--------------------------|
| 2012 | 1                 | UK                       |
| 2013 | —                 | —                        |
| 2014 | 2                 | USA, Korea               |
| 2015 | 1                 | USA                      |

### Training to Foster a Global Mindset

We provide training designed to raise employees’ awareness of themselves as global human resources in order to develop employees who can play an active role worldwide. In fiscal 2015, we conducted a training session for mid-career employees to learn about HR management and leadership in intercultural settings. During the two-day session, participants took part in English discussions facilitated by an instructor from the UK, which motivated them to improve their English abilities and gain an understanding of other cultures.

## Comment from a Participant in a Study Abroad Program

I had the opportunity to participate in a short-term study abroad program in the United States for about five months. During the first three months, I was enrolled in a business program in Berkeley, California. I gained knowledge of necessary topics in a global society, such as international economics and supply chain management, and deepened my understanding of cross-cultural communication through interactions with my classmates. Since the number of times you spoke up in class and the content of what you said affected your grade, I tried to participate actively in my classes. Perhaps thanks to this, I gradually got used to thinking solely in English without translating from Japanese, and felt my English conversational ability improved. During the remaining two months, I visited an affiliate company in Nashville, Tennessee, where I engaged in practical conversations with local employees. There were many female employees working on the manufacturing floor, and people addressed their bosses by their first names. Experiencing a workplace environment so different from Japan was very thought-provoking. My current workplace is becoming more involved with overseas affiliates, so I will continue studying English to reach a level where I can conduct business smoothly in English.



**Norihiro Kato**  
Glass Research Center

## ➤ Creating Workplace Environments Where Anyone Can Succeed

### Employment of persons with disabilities

Japan's amended Act on Employment Promotion, etc. of Persons with Disabilities, which was issued in 2013, took effect in April 2016 with the exception of some parts. At Central Glass, we will strive to eliminate discrimination against persons with disabilities in employment and to provide reasonable accommodation. We will also establish a consultation desk to respond appropriately to in-

quiries from persons with disabilities.

Our employment rate for persons with disabilities as of the end of fiscal 2015 was 2.2%, exceeding the legally mandated rate of 2.0%. Going forward, we will continue to actively address the employment of persons with disabilities and create environments where they can participate more actively.

### Promoting Women's Active Participation

Central Glass will promote the truly active participation of female employees by striving to make the most of its diverse human resources, provide effective education, revise its working environment, and increase productivity. We have formulated an action plan to use this momentum to shape a healthy and vibrant corporate culture where all employees, including women, can succeed.

The target of the first action plan is to lay a foundation for promoting the active participation of women. We will start by conducting a basic survey in preparation for increasing the number of female employees, reconsidering working styles, changing aware-

ness, and opening up more job categories to women.

Building upon the foundation laid under the first action plan, we will implement a second action plan to increase the percentage of women in management positions and carry out initiatives to change employees' awareness.

By promoting the active participation of women, we will become a company where all employees can truly succeed, leading to prosperous lives for our employees and their families. And, by creating diverse employment opportunities, we will advance our social contribution efforts.

## <Action Plan>

**Details of the First Action Plan to Promote the Active Participation of Women** Target Period: Two years from April 1, 2016 to March 31, 2018

### Goal 1: Establish a target percentage for female hires in recruitment (numerical goal).

We will aim for a percentage of approximately double the average percentage for female hires at Central Glass over the past five years.

### Goal 2: Reconsider working styles.

**1. Change from "overtime as the norm" to "overtime as something extra": Change consciousness regarding overtime work from "the norm" to "something extra" for dealing with unexpected circumstances.**

(1) Establish a day on which everyone must leave the office on time (a fixed day every other week). (2) Introduce a schedule request system for overtime work.

**2. Create an environment where taking time off is "the norm": Foster an atmosphere where employees can take time off without worries of troubling others, and improve planning and efficiency of work.**

(1) Introduce a planned time-off system. (2) Clarify the positioning of the use of time off within the evaluation system.

### Goal 3: Conduct an awareness / environmental survey.

Conduct an awareness/fact-finding survey of all employees and tie the results into specific initiatives geared toward the active participation of women, education and career development to shape young employees' ambition for promotion, and opening up more job categories to women.

## ➤ Mental Healthcare

The percentage of workers who feel stress due to anxiety or worries related to work and personal relationships has been growing in recent years as economies and industrial structures change drastically. Together with its Health Insurance Association, Central Glass has been conducting mental health checkups and working to build a care system since 2009.

An amendment to Japan's Industrial Safety and Health Act

in December 2015 made it mandatory for businesses (with 50 or more employees) to conduct stress checks to ascertain the degree of psychological burden among employees. In accordance with this law, Central Glass articulated a basic policy and newly established rules for implementation of a stress check system.

We will use these stress checks in future efforts to foster mental health more actively.

## ➤ Initiatives to Support the Development of the Next Generation

The number of male employees who take an active part in parenting is growing with the rise in nuclear families and the increase in dual-income families. Central Glass has already enhanced its existing support programs for child-raising and made them more flexible. We will continue to create programs that enable both men and women to participate in childcare and will improve our work environment to allow employees to balance work and childrearing.

|  |   |
|--|---|
| Childbirth preparation leave             | Two days per month can be taken for hospital visits during pregnancy.   |
| Maternity leave                          | Legally mandated leave before and after childbirth.   |
| Childbirth leave                         | Up to three days can be taken within a one-month period around the expected date of birth.  |
| Childcare leave                          | Legally mandated childcare leave. Can be extended until the child is 18 months old or March 31 after the child's first birthday. In addition, a maximum of five days are paid starting from the first day of leave. |
| Childrearing leave                       | One day per month can be taken for childrearing.  |
| Nursing care leave for children          | Up to 36 days per year can be taken as nursing care leave for children.   |
| Shortened working hours during childcare | Working hours can be shortened by a maximum of two hours per day.   |
| Staggered working hours during childcare | The start of the workday can be postponed by one hour.  |

### List of programs to support the raising of the next generation

|                  | Expected date of birth  | 6 weeks | 8 weeks | 1 year later | 18 months later | 3 years later | Before elementary school enrollment | First grade | Elementary school graduation |
|------------------|---|---------|---------|--------------|-----------------|---------------|-------------------------------------|-------------|------------------------------|
| Female employees | Childbirth preparation leave  |         |         |              |                 |               |                                     |             |                              |
|                  | Maternity leave   |         |         |              |                 |               |                                     |             |                              |
|                  | Childcare leave (can be extended until the child is 18 months old or March 31 after the child's first birthday) |         |         |              |                 |               |                                     |             |                              |
|                  | Childrearing leave  |         |         |              |                 |               |                                     |             |                              |
|                  | Staggered working hours during childcare  |         |         |              |                 |               |                                     |             |                              |
| Male employees   | Childbirth leave (3 days)   |         |         |              |                 |               |                                     |             |                              |
|                  | Childcare leave (can be extended until the child is 18 months old or March 31 after the child's first birthday) |         |         |              |                 |               |                                     |             |                              |
|                  | Childrearing leave  |         |         |              |                 |               |                                     |             |                              |
|                  | Staggered working hours during childcare  |         |         |              |                 |               |                                     |             |                              |
|                  | Shortened working hours during childcare  |         |         |              |                 |               |                                     |             |                              |
|                  | Nursing care leave for children   |         |         |              |                 |               |                                     |             |                              |
|                  | Childbirth preparation leave  |         |         |              |                 |               |                                     |             |                              |

#### Comment

### Comment from an Employee Who Took Part in the Childcare Leave Program

I took two months of childcare leave when my second son was born. During that time, I took my older son to and from daycare and bathed my younger son. I spent more time with my children than usual. This deepened my family's bonds and my older son became a real daddy's boy. I learned to plan how to use my time efficiently to manage both childcare and housework, and I want to apply this experience back at my job.



**Takashi Otsuka**  
Chemical Research Center

## Society

# To Grow with Society

The support of and harmony with members of the local community are absolutely essential for a company's continued existence. Central Glass will continue to build even better relations with every one of its stakeholders, starting with members of local communities and customers, while also growing and improving together with society in order to realize a sustainable society.

### ➤ 27th Junior Science Classes

The "Summer Vacation Junior Science Class" is held every year under the auspices of the Summer Vacation Junior Science Class Executive Committee and jointly hosted by the Yamaguchi Industrial Promotion Foundation in cooperation with universities, technical colleges, corporate research institutes, and more. It is held in the hope of showing children with infinite future potential how interesting and fun science can be. In 2015, it was held at 17 venues in Yamaguchi Prefecture in collaboration with 12 related organizations between July 21 and August 29.

Central Glass wholeheartedly agrees with the premise, and on July 28 we held a class at the Chemical Research Center (Ube) 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 instructor and prepared hands-on experiments that allowed students to experience the heat energy and light energy found all around us. Participants formed small groups and the seats were arranged for all of the children and their parents to enjoy the class. The children engaged enthusiastically in the experiments, asked the instructors questions, and sometimes gasped in surprise while their parents looked on in enjoyment.

We hope to be able to continue hosting these classes in the future to provide opportunities for more children to learn how exciting and fun science can be and grow up with a greater interest in science.

Number of participants  
(elementary and junior high school students) >>> 20



Lesson in progress



Participating children

Number of boxes sent to  
Thailand & Laos >>> 30



Used clothing collected from throughout Japan

### ➤ 32nd Used Clothing Drive

The Central Glass Labor Union engaged in a used clothing drive for Thailand and Laos organized by the Commission for the Solidarity with the Asian Underprivileged (CSA).

CSA collects used clothes from throughout Japan and sends them to welfare facilities in Thailand, mountain villages in Laos, and disaster-affected areas. The clothes are distributed to people in Thailand and Laos who cannot afford to buy clothes and those who are in need of clothes due to natural disasters such as flooding.

The labor union endorsed the clothing drive as part of its volunteering and charity activities, and employees at branches around the country rallied to offer support. Many of the clothes no longer needed by our employees' households are still in good condition. Employee volunteers sorted the clothes in the hopes that people in Thailand and Laos would receive them with joy. We packed 30 cardboard boxes of clothes sorted by age group and gender and shipped them off.

Aid to people not just in Japan but also around the world is important to the labor union, and we are determined to continue proactively engaging in these activities.

## ➤ 10th RC Regional Dialogue Meeting in the Western Yamaguchi District

Number of participants >>> 110

As part of its Responsible Care (RC) activities, the Japan Chemical Industry Association holds RC regional dialogue meetings in different areas to deepen community members' understanding of chemical companies' environmental conservation efforts and other initiatives.

The Regional Dialogue Meeting in the Western Yamaguchi District is held every other year. The 10th meeting took place at ANA Crowne Plaza Ube in November 2015. Central Glass was one of eight companies that took part in the meeting and gave a panel presentation on the Ube Plant's environmental conservation activities.

Each company described its RC initiatives and a university professor facilitated a roundtable discussion during which views were exchanged on topics such as company responses to accidents and measures to combat odors.

The meeting was a great success, with the participation of around 110 people from the community, local government, universities, people affiliated with companies, and member companies.



The 10th RC Regional Dialogue Meeting

Number of participants >>> 61

## ➤ 13th Regional Town Hall Meeting in the Ube District



The 13th Regional Town Hall Meeting

Four chemical companies located in the Ube District hold an annual regional town hall meeting with local residents. The 13th meeting was held on February 6, 2016 at the Ube Plant of Kyowa Hakko Kirin Co., Ltd. Sixty-one people including members of the local government, NGOs, and local residents participated.

The four companies involved first offered overviews of their plants and their environmental initiatives. The Japan Chemical Industry Association then gave a presentation on chemical companies' communication efforts as part of responsible care activities. Next, the Ube municipal government explained its environmental protection initiatives in Ube City. Following these presentations, the participants were divided into two groups and held discussions on the topics of "security and disaster prevention" and "odors."

Each group had a lively exchange of opinions, and specific concerns regarding security and the environment were raised, making this a highly meaningful town hall meeting. We will continue our efforts to engage in communication with the residents of the region in order to create a safe and secure plant together.

## ➤ Nakazato Beach Cleanup

Number of participants >>> 44

The Central Glass Labor Union holds a training session called "Forum 25" for its younger members. In addition to the usual basic curriculum, Forum 25, which was jointly hosted by the Union's Head Office and Kawasaki branches in May 2015, included a community cleanup for the first time, aimed at fostering an understanding of the nature of volunteerism.

Nakazato Beach, which is near the training site in Shirako, Chiba Prefecture, was chosen as the cleanup location. Overall, the beach was fairly clean, as it was a bit early for the swimming season. Nonetheless, after about an hour of cleaning, the 44 participants had collected around five bags of trash—mainly cans, PET bottles, waste plastic, and paper—and removed a few objects such as scrap iron that would be dangerous to step on barefooted.

Luckily the weather was fair, and the participants were able to have fun cleaning the beach by treating it like a treasure hunt.

Learning the value of activities aimed at the environment was highly meaningful for participants. Going forward, the Labor



Group photo after the cleanup

Union is determined to continue contributing to the environment through encouragement of volunteering and actual community cleanup activities.

## ➤ 41st Volunteer Ono Lake Cleanup

Number of participants ➤ ➤ ➤ 80

The Ube Branch of the Central Glass Labor Union carries out various volunteer activities to contribute to the local community. Together with people from other labor unions and the general public, around 80 volunteers (six from the Central Glass Labor Union) participated in the 41st Volunteer Ono Lake Cleanup, which is organized every year by the Ube Nature Conservancy in late August. As of 2015, the Ube Branch has joined in this activity 21 times.

Ono Lake is a source of drinking water for the cities of Ube and Sanyo Onoda and a rich natural environment that nurtures an abundant ecosystem. The cleanup is an effort to protect this precious resource by clearing out trash and driftwood that have collected in inlets along the coast.

The volunteers divided into two groups to share the work. One group gathered the trash and driftwood that had collected in inlets and put them into transport containers. The other group carried the containers up to the road from the lakeshore and loaded them onto a dump truck.

The people who use the area around the lake seem to have developed better etiquette in recent years, resulting in reduced trash.



A cleanup

The cleanup work was therefore completed in about 30 minutes this time. The scene after the cleanup provided a great sense of accomplishment.

This is an activity specified in the Labor Union's policy, and we are determined to continue it enthusiastically.

## Major Cooperation and Aid Activities

| Dates   | Activities  |  |
|---|---|--|
| Sep. 2015   | Donation by Central Glass to the NPO Peoples' HOPE Japan to fund surgeries for heart diseases                 | 2 million yen (ongoing support)  |
| (The following activities were carried out by our labor union.) |   |  |
| Apr. 2015   | Volunteer Road-side Cleanup by New Union Members  | Organized by the Ube Branch of the Labor Union: 30 people participated   |
| May 2015  | Volunteer Matsunase Beach Cleanup   | Organized by the Matsusaka/Taki Regional Council: 9 people participated  |
|   | "Donating School Bags Full of Memories" Campaign  | Mie Prefectural Council for Laborer Welfare: Donated 17 no-longer-needed Japanese elementary school bags to Afghanistan  |
| Jul. 2015   | Campaign to aid atomic bomb survivors   | At the request of RENGO Local of Yamaguchi, donated 124,701 yen to Yuda-en, a support center for atomic bomb survivors in Yamaguchi Prefecture   |
|   | Prayer for peace: "Thousand Origami Cranes of Love"   | At the request of RENGO Yamaguchi, donated 700 origami cranes for a Hiroshima peace event and "Hiroshima Day in Yamaguchi"   |
|   | Stand at a flea market  | Sold items provided by employees (including officers and managers) and will donate the proceeds to welfare organizations in Japan and overseas<br>Proceeds in 2015: 30,540 yen (to be donated once the total reaches a certain amount)   |
| Aug. 2015   | "Ecocap" program  | Organized by the Central Glass Labor Union: Delivered 101,910 bottle caps (ecocaps) to a contractor (equivalent to the cost of purchasing polio vaccines for 119 people)   |
| Sep. 2015   | Clean Arohipelago Campaign  | At the request of Ube District Committee, Chubu Regional Council, RENGO Yamaguchi: 18 people participated  |
| Oct. 2015   | Ube Plant Festival: "Volunteer Road-side Cleanup"   | Organized by the Labor Union's Ube Branch: 50 people participated  |
|   | Cleaning Curved Mirrors on the Road in Mikumo District, Matsusaka City  | Organized by the Matsusaka/Taki Regional Council: 10 people participated   |
| Nov. 2015   | Volunteering for the Prescribed Burn of the Akiyoshidai Plateau   | At the request of RENGO Yamaguchi: 4 people participated   |
|   | Volunteer beach cleanup   | Organized by the Ube District Council for Laborer Welfare: 12 people participated  |
| Dec. 2015   | Year-End Welfare Campaign by Ube District Committee, the Chubu Regional Council, and RENGO Local of Yamaguchi | Donated to the Shinsei-kai Ube Kurumi-en, a social welfare corporation in Ube City via the Ube District Committee<br>Funds raised: 100,000 yen   |
|   | Petition to introduce grant-style scholarships  | Organized by the Central Council for Laborer Welfare: One in two Japanese university students takes out student loans called "scholarships" and is then forced to repay up to several million yen after graduation. The Union participated in a campaign to collect signatures for a petition aimed at improving the scholarship system, which has become a societal problem. Signatures collected by the Union: 1,533 |
|   | RENGO Ai Campaign<br>OISCA Children's Forest Program  | Money sent to JEC through the Labor Union's headquarters (Total funds raised: 218,956 yen)<br>(Breakdown: 54,293 yen from Ube; 33,333 yen from Sakai; 38,032 yen from Matsusaka; 12,103 yen from Kawasaki; 81,195 yen from the head office)  |

## Activities at Individual Plants

### Ube Plant



|                      |  |
|----------------------|--|
| Address              | 5253 Okiube, Ube City, Yamaguchi                 |
| Number of employees  | 547 (as of March 31, 2016)                       |
| Major items produced | fluorine-related 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 started manufacturing soda ash and caustic soda in 1936, and expanded its operations into the manufacturing of chemical fertilizers and inorganic chemical products.

In May 2015, we discontinued production of soda ash and related products, which had been our main products since the founding of the company. Going forward, we will put our full efforts into new businesses that will enable us provide environmentally friendly products such as HFO-1233zd(E), a foaming agent with a low global warming potential, in addition to the fine chemicals business, including active pharmaceutical ingredients and high-purity fluoride gas.

The plant's green spaces have been furnished with rows of cherry trees, and in spring, local residents are able to enjoy the beautiful blossoms and the natural environment that exists in harmony with us. We will continue in our efforts to be a safe and open plant that offers local residents a feeling of security.



**Nobuyuki Tokunaga**  
General Manager Ube Plant

#### Regional Activities

- Cleanup activities for city and prefectural roads on our plant-wide 5S Day (once a month)
- RC Regional Dialogue Meeting in the Western Yamaguchi District (once every two years)
- Regional town hall meeting in the Ube district (once every year)
- Cleanup activities in Tokiwa Park (once a year)
- Cleanup activities around Lake Ono (once a year)
- Protection and cultivation of grasslands at Akiyoshidai (once a year)
- Cleanup activities around Ube Higashi Port (once a year)
- Forest maintenance activities to protect water resources (once a year)
- Road cleaning using road sweepers (every day)

### ➤ Contributing to the Community through Cleanups

In cooperation with the Labor Union, the Ube Plant carries out a variety of activities to contribute to the community.

These include: an annual cleanup in Tokiwa Park, which is a leading park in Yamaguchi Prefecture; protection of the symbols of Ube as "a city of greenery, flowers, and sculpture"; an annual cleanup of Lake Ono, which is a water source for Ube City; and active participation in an annual forestry activity to protect water as a form of forest maintenance in the Koto River system, with the aims of restoring the watershed and maintaining the forest's function in preventing global warming.

Additionally, we engage in cleanup activities with the top prior-



Ocean cleanup



Forestry activities

ity of allowing nearby residents to live comfortably. We strive to beautify the environment around the plant through an annual cleanup around Ube Higashi Port, daily road cleaning using road sweepers, and a monthly cleanup along city and prefectural roads bordering the plant on our plant-wide 5S Day, with each department sharing responsibility.

#### PRTR

(Unit: kg/year)

| Ordinance designation No | Substance name   | Emissions                |       |      | Comparison with the previous year | Quantity transferred |
|--------------------------|--|--------------------------|-------|------|-----------------------------------|----------------------|
|                          |  | Atmosphere               | Water | Soil |                                   |                      |
| 16                       | 2,2'-Azodiisobutyronitrile   | 0                        | 0     | 0    | →                                 | 0                    |
| 33                       | Asbestos   | 0                        | 0     | 0    | →                                 | 8,000                |
| 41                       | 3'-Isopropoxy-2-trifluoromethylbenzanilide(also known as Flutolanil) | 0                        | 0     | 0    | →                                 | 0                    |
| 53                       | Ethylbenzene   | 2,000                    | 0     | 0    | ↗                                 | 0                    |
| 80                       | Xylene   | 3,000                    | 0     | 0    | ↗                                 | 1.7                  |
| 81                       | Quinoline  | 0                        | 0     | 0    | →                                 | 0                    |
| 232                      | N,N-Dimethylformamide  | 19                       | 0     | 0    | →                                 | 3,800                |
| 243                      | Dioxins  | (Unit: mg-TEQ/year) 0.20 | 0.11  | 0    | ↗                                 | 0                    |
| 281                      | Trichloroethylene  | 1,200                    | 0     | 0    | ↗                                 | 0                    |
| 296                      | 1,2,4-Trimethylbenzene   | 140                      | 0     | 0    | ↘                                 | 0                    |
| 300                      | Toluene  | 1,100                    | 0     | 0    | ↘                                 | 0                    |
| 349                      | Phenol   | 83                       | 150   | 0    | ↘                                 | 0                    |
| 374                      | Hydrogen fluoride and its water-soluble salts                        | 760                      | 0     | 0    | ↗                                 | 8,100                |
| 400                      | Benzene  | 34                       | 0     | 0    | ↗                                 | 470                  |
| 411                      | Formaldehyde   | 0                        | 0     | 0    | →                                 | 0                    |
| 438                      | Methylnaphthalene  | 39                       | 0     | 0    | ↗                                 | 0                    |

\*Quantities emitted, discharged, or transferred are listed for those materials handled in amounts exceeding 1,000 kg in 2015 (except for dioxins)



# Kawasaki Plant



|                      |   |
|----------------------|---|
| Address              | 10-2 Ukishima-cho, Kawasaki-ku, Kawasaki City, Kanagawa |
| Number of employees  | 199 (as of March 31, 2016)                              |
| Major items produced | Inorganic chemicals, organic chemicals                  |
|                      | Acquired ISO 14001 certification (May 2007)             |
|                      | Acquired ISO 9001 certification (July 2001)             |

## Message from the General Manager

The Kawasaki Plant recently transitioned from the soda electrolyte business to the fine chemicals business. Our main products currently include HFC-245fa (an alternative to CFCs, pharmaceutical intermediates, cleaning gases for semiconductors, and photoresist materials). Our production system allows us to stably supply a wide range of fine chemicals products. We have also launched full-scale production of a range of environmentally friendly products, including HFO-1233zd(E), a foaming agent with a low global warming potential and superior heat insulation properties, which won an Award of Excellence at the 17th Ozone Layer Protection and Global Warming Prevention Awards, and next-generation electrolytes for lithium-ion batteries.



**Yukinari Hashimoto**  
General Manager  
Kawasaki Plant

Last year we also launched mass production of Pattern Keeper™, a water-repelling drying agent for semiconductor wafers that addresses the problem of circuit pattern collapse in the drying process associated with the increasing density and more advanced performance of semiconductors. In this way, we are actively working to manufacture new products suited to customer needs.

### Regional Activities

- Roku-Cho-Kai (Regular social gatherings with residents of neighboring areas including Tono Town and the Daishi District)
- Regular cleanups of the roads around the plant
- Regular exchanges of information concerning the environment and safety with employees of neighboring plants in the Kawasaki Industrial Complex
- Activities related to environmental safety conducted to improve the local environment through the Research Society for Environmental Safety Technology in the Kawasaki Industrial Complex
- Participation in joint disaster drills with neighboring businesses in the Ukishima District
- Participation in street-level traffic safety guidance (organized by the Kawasaki Rinko Traffic Safety Association)

## ➤ Street-Level Traffic Safety Guidance

The Kawasaki Plant is located in an exclusive industrial zone, so we have very little contact with nearby residents. However, the Kawasaki Rinko Traffic Safety Association, of which the Kawasaki Plant is a member, conducts street-level traffic safety guidance during work and school commuting hours as part of nationwide traffic safety campaigns held every spring and summer. The Kawasaki Plant participates every year together with members of nearby plants.

As this area is an exclusive industrial zone, trucks and large vehicles loaded with hazardous materials pass through frequently. Accordingly, we provide guidance emphasizing the prevention of traffic accidents involving children and the elderly, of which there have been many in recent years, as well as bicycle safety.

Every year, the Kawasaki Plant invites instructors from the Rinko Police Station and Traffic Safety Association to raise employees'

awareness by informing them of legal changes and the current situation regarding traffic accidents in Kawasaki City, and teaching them safe attitudes when driving a motor vehicle. Keeping in mind that we too are members of the community, we utilize the information and knowledge we gained in those classes to issue alerts to neighborhood residents and people commuting to work and school with the aim of reducing traffic accidents in the area by even one incident. The Kawasaki Plant will continue to participate in this street-level guidance in order to contribute to the community by raising awareness of traffic safety.



Street-level traffic safety guidance

### PRTR

(Unit: kg/year)

| Ordinance designation No | Substance name                                | Emissions  |       |      | Comparison with the previous year | Quantity transferred |
|--------------------------|---|------------|-------|------|-----------------------------------|----------------------|
|                          |   | Atmosphere | Water | Soil |                                   |                      |
| 81                       | Quinoline                                     | 0          | 0     | 0    | ↗                                 | 0                    |
| 94                       | Chloroethylene (also known as vinyl chloride) | 3,400      | 0     | 0    | ↗                                 | 0                    |
| 149                      | Tetrachloromethane                            | 250        | 0.6   | 0    | ↘                                 | 11,000               |
| 213                      | N,N-Dimethylformamide                         | 12         | 0     | 0    | ↗                                 | 70,000               |
| 243                      | Dioxins (Unit: mg-TEQ/year)                   | 0.21       | 0.78  | 0    | ↘                                 | 0                    |
| 262                      | Tetrachloroethylene                           | 0          | 0     | 0    | ↘                                 | 1,500                |
| 280                      | 1,1,2-trichloroethane                         | 0          | 2.4   | 0    | ↘                                 | 1,600                |
| 300                      | Toluene                                       | 140        | 0     | 0    | ↘                                 | 2,400                |
| 374                      | Hydrogen fluoride and its water-soluble salts | 0          | 0     | 0    | →                                 | 67                   |
| 392                      | n-hexane                                      | 0.5        | 0     | 0    | →                                 | 10,000               |
| 405                      | Boron compounds                               | 0          | 0     | 0    | →                                 | 0                    |

\*Quantities emitted, discharged, or transferred are listed for those materials handled in amounts exceeding 1,000 kg in 2015 (except for dioxins)

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

# Matsusaka Plant



|                      |  |
|----------------------|--|
| Address              | 1521-2 Okuchi-cho, Matsusaka City, Mie   |
| Number of employees  | Plant : 203 (as of March 31, 2016)   |
| Major items produced | Safety glass for automobiles, architectural and industrial flat glass, fabricated glass, functional glass for electronic equipment |
|                      | Acquired ISO 14001 certification (April 2000)  |
|                      | Acquired ISO 9001 certification (November 2003)  |
|                      | Acquired ISO/TS 16949 certification (June 2004)  |

## Message from the General Manager

The Matsusaka Plant manufactures polished plate glass using the world's only duplex equipment capable of employing a consecutive double-sided polishing method. We also manufacture flat glass such as high-permeability cover glass for photovoltaic cells and processed glass for automotive and industrial applications.

Because the plant consumes a huge amount of energy and resources, we have been energetically implementing environmental conservation activities for many years.

In order to conserve energy and power and reduce CO<sub>2</sub> emissions, we are working to reduce loss, introducing equipment that conserves energy in conjunction with large-scale renovations, and pushing ahead with improvements to our operational technologies.

We reuse almost all of our end glass, and since 2004 we have maintained zero emissions. However, we are continuing to work on deriving value from our waste (i.e. converting it into products) in order to achieve a higher standard of waste reduction activities.

Each of our employees is continually working to achieve growth and improvement, based on our motto, "The Matsusaka Plant: Everything for the sake of people and the global environment - Looking at the future through glass." We will continue to contribute to our region and work to make our plant safe and happy, never forgetting our sense of gratitude.



**Akira Yuasa**  
General Manager  
Matsusaka Plant

### Regional Activities

- Participation in Mie Prefecture Kids' ISO 14000 Program activities
- Participation in cleanup of waste drifting ashore at Toshijima Island, Toba City, organized by the Mie Prefecture Industrial Waste Countermeasures Promotion Council
- Exhibition of Eco-Glass at the Matsusaka Environmental Fair held by the Matsusaka City Environmental Partnership Committee
- Opening of plant grounds to youth sports associations and other organizations free of charge
- Provision of company-owned land to neighboring municipalities as temporary parking areas free of charge
- Inviting local residents to plant's summer festival
- Participation in the Aqua Social Festival in Matsunase, organized by Mie University's Mie Global Environment Center for Education & Research (beach cleanup)
- Participation in voluntary cleanup activities at Matsunase Beach organized by the Matsusaka Taki District Workers' Welfare Council (Matsusaka Branch of the Labor Union)
- Participation in Ecocap (bottle cap collection) activities (Matsusaka Branch of the Labor Union)

## ➤ Danger Simulation Dojo

The Matsusaka Plant carries out danger simulation workshops with the aim of raising the danger sensitivity and safety awareness of each and every employee.

In March 2015, we opened a "Danger Simulation Dojo" equipped with original devices designed jointly by veteran and junior employees of the Engineering & Technical Section, including a falling glass weight simulation device and a glass cut simulation device. The dojo is used for a variety of educational programs, including training of new hires and job rotation training.

During these training workshops, veteran employees recount cases of accidents that they witnessed firsthand in the past and trainees experience simulated dangers. These are valuable opportunities to pass along and share awareness of disaster prevention measures.



Glass cut simulation device



Falling glass weight simulation device

### PRTR

(Unit: kg/year)

| Ordinance designation No | Substance name              | Emissions  |       |      | Comparison with the previous year | Quantity transferred |
|--------------------------|-----------------------------|------------|-------|------|-----------------------------------|----------------------|
|                          |                             | Atmosphere | Water | Soil |                                   |                      |
| 31                       | Antimony and its compounds  | 0          | 0     | 0    | ↘                                 | 0                    |
| 132                      | Cobalt and its compounds    | 0          | 0     | 0    | →                                 | 0                    |
| 242                      | Selenium and its compounds  | 92         | 0     | 0    | ↗                                 | 0                    |
| 405                      | Boron compounds             | 0          | 0     | 0    | →                                 | 0                    |
| 412                      | Manganese and its compounds | 82         | 0     | 0    | ↗                                 | 0                    |
| 438                      | Methylnaphthalene           | 45         | 0     | 0    | ↗                                 | 0                    |

\*Quantities emitted, discharged, or transferred are listed for those materials handled in amounts exceeding 1,000 kg in 2015.

In 2002, the Matsusaka Plant discovered groundwater containing arsenic and lead attributable to a past production method. It is currently continuing groundwater purification treatment.

# Matsusaka Plant

## – Sakai Manufacturing Site



|                      |  |
|----------------------|--|
| Address              | 6 Chikko-minamimachi, Sakai-ku, Sakai City, Osaka  |
| Number of employees  | Plant : 47 (as of March 31, 2016)  |
| Major items produced | Architectural and residential flat glass, flat glass for electronic equipment, architectural frosted glass |
|                      | Acquired ISO 14001 certification (December 1999)<br>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 we have been manufacturing flat glass continuously since 1959 as the birthplace of the Central Glass Flat Glass Division. In 1982, we adopted the float process as our manufacturing method and started manufacturing high-grade flat glass.

In 2007, we completed our second round of cold repair work (repairs of the entire manufacturing lines starting from melting furnaces). As part of this process, we conducted improvement work that reduced our CO2 emissions by 3%, and restarted production in April 2008. In August 2009, we conducted work to improve our float baths, and began manufacturing thin flat glass for use in electronic devices such as smartphones and other mobile terminals.

In May 2012, we completed our installation of spattering equipment that deposits thin metallic membranes on glass surfaces and began manufacturing Eco-Glass, a product that can reduce the cost of cooling and heating buildings. We are currently making ongoing efforts to reduce our fuel consumption by improving heat retention and adjusting operating conditions for our glass-melting furnace. Efforts to further reduce waste through recycling and the conversion of waste into valuables are also ongoing.

We will keep aiming to be an environmentally friendly plant that contributes to the community.



**Tatsuo Kikuchi**  
General Manager  
Sakai Manufacturing Site  
Matsusaka Plant

### Regional Activities

- Participation in the Osaka Bay Cleanup Project
- Activities to inform the public about fires and first aid at the Sakai Fureai Festival as a member of the Sakai City Disaster Response Committee
- Participation in comprehensive disaster drills in the Sakai/Senboku coastal area
- Support for a flea market and donation of proceeds to social welfare activities
- Response to requests for dispatch of staff for rescue, firefighting, disaster relief, etc. as a plant that cooperates with Sakai City over firefighting
- Provision of support for a project conducted by the Osaka Prefectural Seikoukai in Sakai Senboku Port to ensure the safety of ships navigating through the port and protect the environment

## ➤ Participation in Fiscal 2015 Osaka Bay Cleanup Project

Every year we conduct beautification activities along the Osaka Bay sea walls as part of a joint campaign organized by Osaka Prefecture to remove trash and ensure the cleanliness of the water in Osaka Bay.

We conducted a cleanup from south to north along the coast on the levee on the western side of Sakai's Second Ward, which is located to the northwest of the Sakai Manufacturing Site. While we were taken aback by the greater-than-expected amount of trash, we began the collection work with over 150 people.

There were especially large numbers of wooden pieces and PET bottles. This made us realize the importance of being careful when throwing away the PET bottles that we use so frequently in our daily lives.

After sending off numerous truckloads of trash, the sight of the clean quay wall filled us with a sense of satisfaction and joy at our

contribution to society. The cleanup also allowed us to work together with employees of the Marine Safety Station and other participating companies, even if only for a short time, which made it a very meaningful event.

The Sakai Manufacturing Site will continue to participate actively in these kinds of activities.



Cleaning up

### PRTR

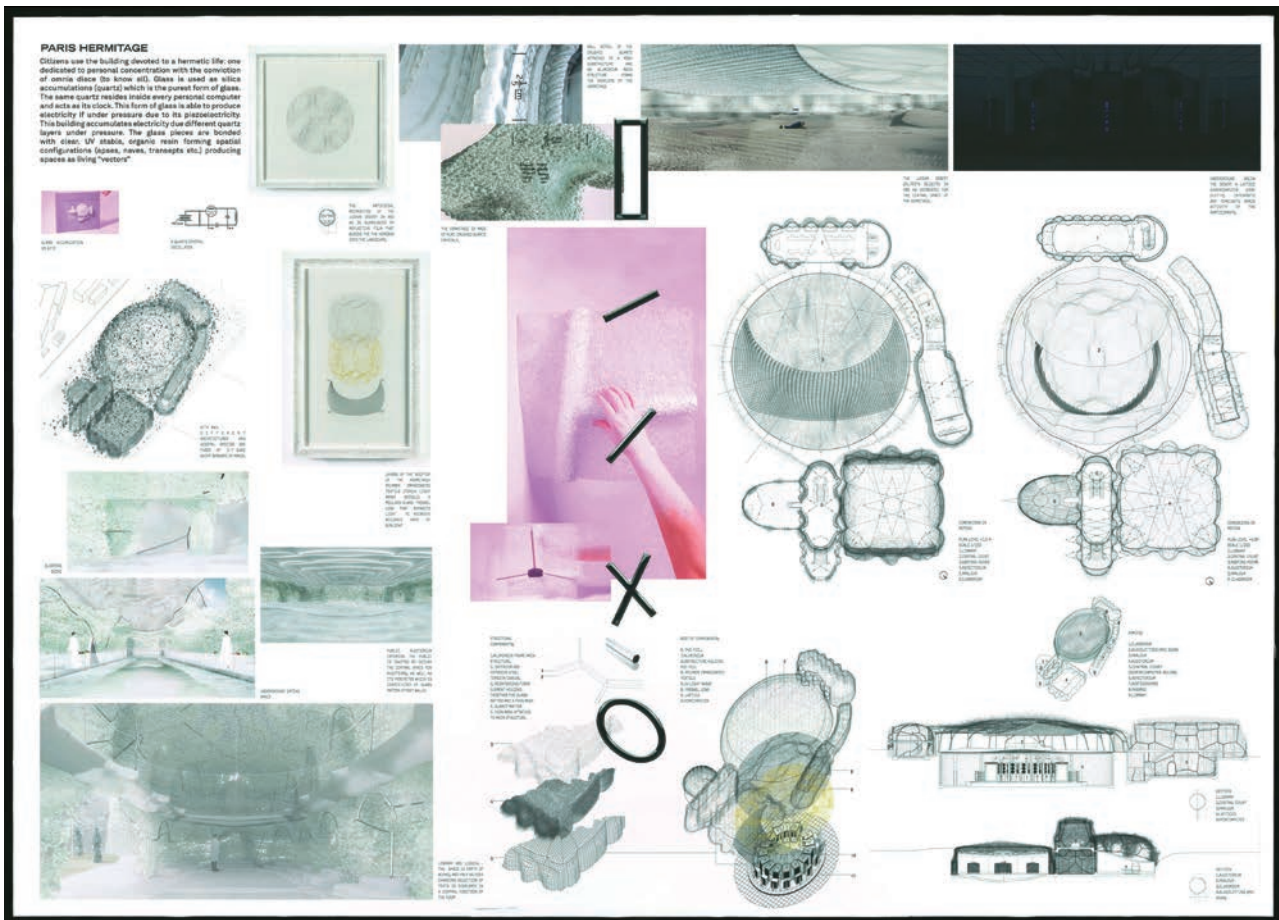
(Unit: kg/year)

| Ordinance designation No | Substance name         | Emissions  |       |      | Comparison with the previous year | Quantity transferred |
|--------------------------|------------------------|------------|-------|------|-----------------------------------|----------------------|
|                          |                        | Atmosphere | Water | Soil |                                   |                      |
| 80                       | Xylene                 | 68         | 0     | 0    | ↘                                 | 0                    |
| 296                      | 1,2,4-Trimethylbenzene | 78         | 0     | 0    | ↘                                 | 0                    |

\*Quantities emitted, discharged, or transferred are listed for those materials handled in amounts exceeding 1,000 kg in 2015.

# 50th Central Glass International Architectural Design Competition

First Place:Valle Medina (Switzerland) and Benjamin Reynolds (Switzerland)



## Theme: The Glass

The Central Glass International Architectural Design Competition marked its 50th year. In commemoration, we have chosen a theme inquiring into the essential meaning of glass.

One cannot discuss modern architecture without referring to glass. Advances in materials and equipment have made building environments more comfortable. Yet, among them, glass stands out for its critical role in creating hospitable environments for people. Hereafter, glass will no doubt maintain its importance to architecture, as high-function glass products successively appear. On the other hand, advances in glass performance

may, to the contrary, inhibit architecture's freedom. By entirely shutting out exterior noise and air, does glass truly create a comfortable space? We grow so accustomed to the relationship of glass to architecture that we neglect to consciously give play to the true fascination of glass.

Our theme this time, "The Glass," is intended to provide an opportunity for rethinking the role fulfilled by glass in architecture, in the hopes that the relationship between glass and architecture might be made even richer. Through our study of this theme, we may be able to produce a new dynamic balance between architecture and glass.

 **CENTRAL GLASS CO., LTD.**

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