

# The 47th Central Glass International Architectural Design Competition

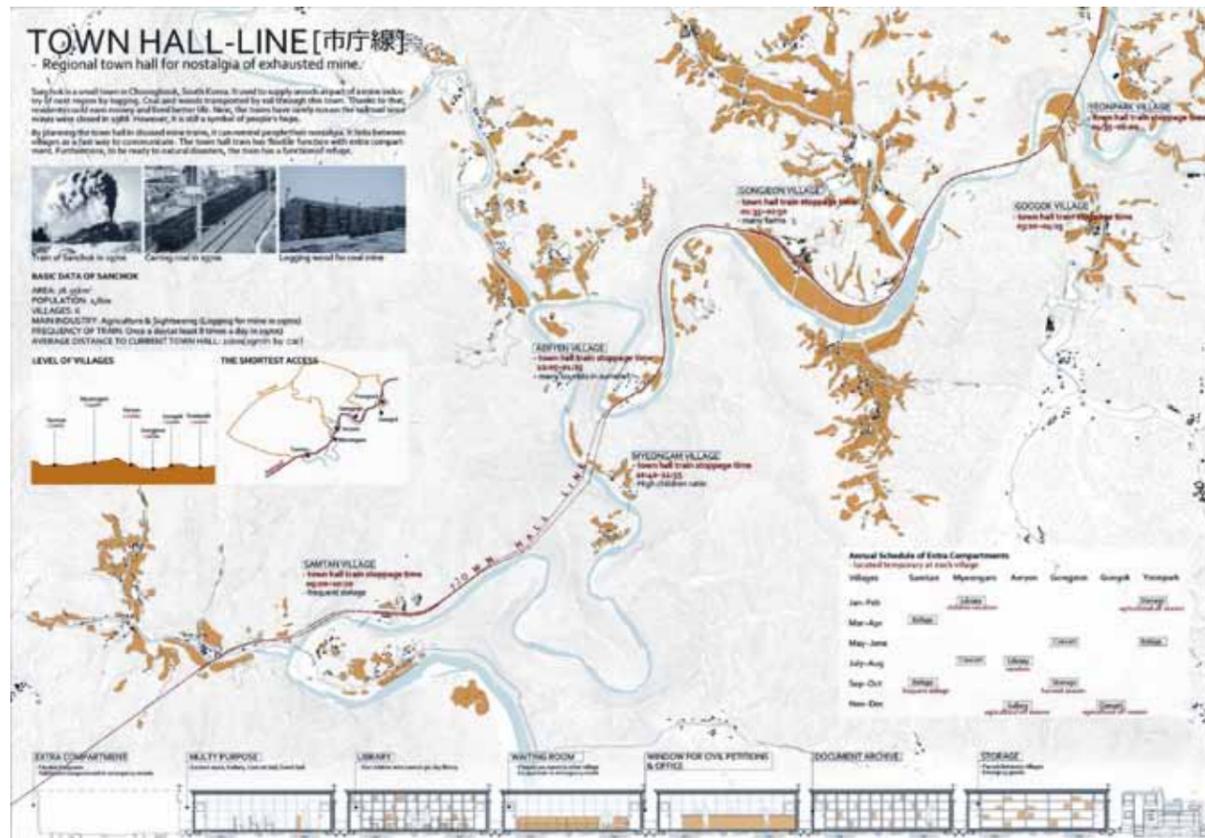
## Theme: Town Hall in a Regional Environment

The role played by town halls is changing. With amid concerns for the declining birthrate and aging population, and the weakening of ties between residents within communities, town halls are expected to be not just simply public spaces, but also to be bases of new activities which are different in the past. It is essential to provide people with excitement, joy and affluence in daily life and to take prides in themselves, especially in decaying cities or are about to decline due to aging or declining populations.

Town halls are also required to be a place to provide accurate information quickly and to be a safe refuge in case of disasters. Specially in recent years, it has become mandatory for public buildings to be sustainable. However, they are required to be spacious and durable structures rather than model buildings of environmental friendliness. Sustainability has become a prerequisite for town halls, and it is not just an ideal anymore.

(Refer to page 19 for a related article)

First Place Winner Joohei Son (Korea)



# Responsible Care Report



# From “Survival” to “Sustainability” — For Being an Indispensable Company to Society —

## Environmental Principles

Central Glass will help create a truly prosperous society through the production of goods and services, by giving consideration to 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 groupwide scale in all activities spanning from R&D to production and sales.
- 2 We will build frameworks and systems which 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 global resources and by recycling waste.
- 5 We will observe laws and regulations relating to 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.



### Q1 What products are particularly noteworthy from a social and environmental perspective?

Our company is currently pouring effort into development of new products and expansion of our business scale in fields especially related to “environment,” “health” and “energy.” “Eco-Glass” is excellent at improving energy-saving effects with its superior heat-shielding and insulating performance. “Cover glass for solar photovoltaic power generation” is expected to grow in the future as solar photovoltaic power in general is still in a developing stage. Lithium-ion battery electrolyte and HFO-1233zd(E), a new material for blowing agents with low global warming potential (GWP<5) and excellent heat insulation capacity, are also our products which will contribute to our environmental initiatives. Central Glass Co., Ltd. addresses a variety of energy and environmental issues, while striving to be an indispensable company that contributes to people and global environment by producing necessary ones to society.

### Q2 What is your plan on your human resources?

We regard it “skilled manufacture starts from fostering human resources.” We know that we must foster great human resources before manufacturing good products. In particular, development of human resources, who are able to deal with globalization that is currently accelerated, is our most issue. We are not only encouraging learning English and Chinese, but also cultivating our younger employees to be able to engage in a wide range field, through various educational programs. In addition to this, we do our best to understand each other including recognizing different cultures and customs by exchanging information at created occasions, such as “administrative meeting for overseas subsidiaries” in which our top executives of overseas subsidiaries come together. On the other hand, we reviewed our re-employment system in 2012 for allowing motivated people to continue working on-site until the age of 65, in aiming for not depriving younger people of job opportunities, yet for veteran employees to hand on their skills and knowledge which have been cultivated over the years to younger people.

### Q3 What initiatives are you implementing as growth strategies?

The base of our sustainable corporate growth as a manufacturer is to launch outstanding new products that are needed by society onto the market. Our company strives to speed up research and development, and at the same time we have established a system known as “Future Fund.” This is a research-development budget specifically dedicated to creating next-generation products in new fields that are independent from existing businesses. It is a system that promotes research and development with a long-term view of the future. It began in 2011, and there are eight developed themes currently. It is also being used in the search for the seeds of new research by collaborative, commissioned, and etc.

### Q4 What efforts are you engaging for profits?

Reviewing cost structure as well as developing new products is one of our main focuses. Our biggest issue, particularly both in the glass and in the chemicals businesses, is cutting energy costs. As we heavily depend on overseas sources both for raw-fuels and resources, our future challenge is how we can lower energy costs. To deal with this challenge, we established the “Energy Project” this

year in which we are implementing cross-corporate examination to further promote energy savings.

### Q5 What will you focus on in the future?

As I mentioned earlier, our further expansion of our international operations is an absolute necessity. Fostering global human resources is its foundation as I also mentioned earlier. Currently, we have overseas subsidiaries in the U.S., the U.K., Germany, Taiwan, China and Vietnam, and we explore business opportunities mainly in the ASEAN region by making use of newly established subsidiaries in India and Korea. We will take advantage of the merits of so-called “Japanese-style management” to shift our focus from “survival” to “sustainability,” and strive to be an indispensable company to society.

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

# Responsible Care Report

Social & Environmental Report 2013



Report period April 2012 to the end of March 2013  
 Target of report Central Glass Group  
 (except summary of data was limited to the plants and research institutes of Central Glass Co., Ltd.)  
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# Corporate Outline & Overseas Subsidiaries and Affiliates

## Corporate Outline

Company Name	Central Glass Co., Ltd.
Established	October 10, 1936
Head Office	Kowa-Hitotsubashi Building 7-1, Kanda-nishikicho 3-chome Chiyoda-ku, Tokyo 101-0054, Japan <a href="http://www.cgco.co.jp/">http://www.cgco.co.jp/</a> <a href="http://www.cgc-jp.com/">http://www.cgc-jp.com/</a>
Paid-In Capital	¥18,168 million
Number of Employees	5,009 (consolidated)
Common Shares	Authorized 867,944,000 Issued 214,879,975

## Business Division/Segment/Major Products

Business Division	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, Photovoltaic(PV)glass
	Automotive glass	IR-cut glass, UV-cut glass, Antenna glass, Privacy glass, Module glass, Acoustic glass, Anti-fog glass, and other various safety glass
	Display glass	Thin flat glass, Chemical tempered glass, Power glass, Glass paste
Chemicals Business	Basic chemicals	Soda ash, Calcium chloride, Polyaluminum chloride, Gypsum, Fluorochemicals
	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 chemicals fertilizer, Fertilizer materials, Microbial control agents/materials
	Glass fibers	Glass fiber, Glass wool

## Overseas Subsidiaries and Affiliates

Carlex Glass Company (U.S.A.)	Tel. +1-423-884-1105	Fax. +1-423-884-1041
Carlex Glass America, LLC (U.S.A.)	Tel. +1-615-350-7500	Fax. +1-615-350-7685
Central Glass America, Inc. (U.S.A.)	Tel. +1-423-884-1105	Fax. +1-423-884-1041
Central Glass International, Inc. (U.S.A.)	Tel. +1-408-573-6909	Fax. +1-408-573-6911
SynQuest Laboratories, Inc. (U.S.A.)	Tel. +1-386-462-0788	Fax. +1-386-462-7097
Northwestern Industries, Inc. (U.S.A.)	Tel. +1-206-285-3140	Fax. +1-206-285-3603
Yue Sheng Industrial Co.,Ltd. (Taiwan)	Tel. +886-37-871-811	Fax. +886-37-874-154
Taiwan Central Glass Co.,Ltd. (Taiwan)	Tel. +886-37-876-586	Fax. +886-37-876-448
Giga Gas & Electronic Materials Company (Taiwan)	Tel. +886-2-2311-6602	Fax. +886-2-2311-6607
Central Glass Trading (Shanghai) Co.,Ltd. (China)	Tel. +86-21-6219-9791	Fax. +86-21-6275-2691
Zhejiang Central Glass Chemspec Company Ltd. (China)	Tel. +86-570-388-8333	Fax. +86-570-388-8333
Saint-Gobain Central Sekurit (Qingdao) Co.,Ltd.(China)	Tel. +86-532-5871-8326	Fax. +86-532-5871-8338
Central Glass Europe Limited (U.K.)	Tel. +44-161-406-0888	Fax. +44-161-406-0999
Apollo Scientific Limited (U.K.)	Tel. +44-161-406-0505	Fax. +44-161-406-0506
Central Glass Germany GmbH (Germany)	Tel. +49-5201-6613-0	Fax. +49-5201-6613-118
Thai Central Chemical Public Co.,Ltd. (Thailand)	Tel. +66-2-639-8888	Fax. +66-2-639-8999
Japan Vietnam Fertilizer Company (Vietnam)	Tel. +84-8-6290-5069	Fax. +84-8-6290-5066
Central Glass Korea Co.,Ltd. (Korea)	Tel. +82-2-555-3992	Fax. +82-2-561-7813
Central Glass Company India Private Limited (India)	Tel. +91-124-421-7095	Fax. +91-124-421-7094



## Building a Richer Society Hand-in-Hand with Our Customers.

As a materials manufacturer, we, Central Glass aim to boost the product appeal to our client corporations in order to offer valuable products to society. In our glass products business, our goal is to realize a richer society, hand-in-hand with our customers, through the development of high value-added products that answer to the needs of society.

## Super UV Cut Glass (SUV)

Implementing UV Measures in Automotive Door Windows for a Greater Comfortable Interior Space.



### For Safety

In today's society, automobiles play a pivotal role in logistics. They are also used for commuting to work or school, for leisure, and as a means of transportation, making it an indispensable part of our daily lives. Automobiles are required to have a high level of safety, and it is needless to say that the requirements for automotive glass have also become stricter. While manufacturing our products under strict control, we have strived daily to try and find ways in which we can contribute to the progress of the automotive industry as a flat glass manufacturer.

### What Are the Requirements for Glass?

According to the results of a driver survey on automotive windows and things closely associated with them, points of dissatisfaction include sunburn, heat, glaring light, and misting. Women drivers in particular are concerned about sunburn from UV light.

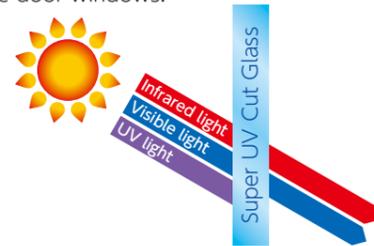
### For a Greater Comfortable Interior Space

Drivers tend to get sunburned on their window side. As shown in the table, this is due to differences in the UV transmittance of automotive windows by sites of an automobile and types of glass used. Sunburns can be reduced by lowering the UV transmittance by door windows glass, and we aimed to do this to offer women

### Light Controlling Technology Is the Key

Sunburn, heat and glare are caused by light transmittance. Generally speaking, sunburn is caused by UV light, heat by IR light, and glare by visible light. As for visible light, we should not lower light transmission rate considering safety, so we can only adjust UV or infrared light transmittance. In other words, we need to control light selectively.

drivers a greater comfortable interior space. Our company has experience in developing infrared (IR) cut glass for doors in the past. The light controlling technology we cultivated in helped us to develop glass that specifically cut out UV light, and we managed to find a practical application for automotive door windows.



UV transmittance: 1% or lower

### UV transmittance of Different Windows in Automobiles

Front windshield	Door window		
	Normal glass	UV	SUV
1% or lower	27.4%	11.1%	1% or lower

### Preparation for Production

We have acquired light controlling technology in automotive door windows, but to actually apply this to mass production, we still have many issues that need to be addressed, including making preparations for production, adjusting conditions for production, and finding ways to manage it. As we have experience in turning a variety of items into commercial products, we are making full use of it. Even so, there are many obstacles that need to be cleared for producing a new product, requiring extraordinary effort, but, we are finally on the verge of achieving our goal. Please look forward to our new developments.

## "ARMOREX<sup>®</sup>," a Cover Glass for Touch Panels

Achieving Increased Production Efficiency with Better Workability Than Traditional High-Strength Glass.



### Demands of the Times

Many mobile devices such as smartphones and tablet PCs, which are spreading rapidly throughout the world, are equipped with touch panels. To users, touch panels have a merit of allowing intuitive operation. On the other hand, the glass used in these devices must be of high strength in order to prevent scratches on the panel's surface during operation, and protect against breakage if dropped. For these reasons, glass is often used as a material to cover touch panels, and this glass must not only be transparent, but it is required to have conflicting properties of being resistant to scratching and cracking, while being thin and lightweight.



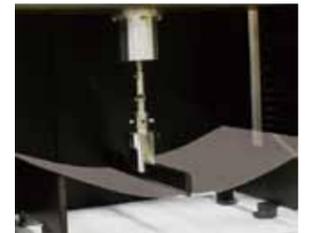
ARMOREX<sup>®</sup>

### Endeavors of Central Glass

To meet various requirements of cover glass for touch panels, we launched "ARMOREX<sup>®</sup>" in October 2010, a high-strength chemical tempered glass that possesses both high-strength with outstanding workability and cost performance.

### Features of "ARMOREX<sup>®</sup>"

Unlike existing products already on the market, "ARMOREX<sup>®</sup>" is based on soda-lime glass widely used for displays, combined with our unique chemical tempering process. It is soda-lime glass that is of sufficient strength to meet the demands of cover glass for touch panels (about six times stronger than untreated soda-lime glass). Furthermore, it retains the beneficial processing capabilities-cutting of soda-lime glass as well as being high-strength. In an anticipation of competition for market share and lower prices for touch panels, "ARMOREX<sup>®</sup>" is the glass to enable a vast array of lower priced applications including touch panels integrated glass covers that are expected to become popular.



Bending test

\* "ARMOREX<sup>®</sup>" is a trademark registered in Japan.  
\* ARMOREX is a coined word made by combining the word "armor," from its image of providing protection for smartphone and tablet PC screens, with the Latin word "rex," meaning "king."

### VIEWS

Our issue was how to add even greater value to what we were already offering in soda-lime glass, which is one of our main products. Our company has been strengthening soda-lime glass using chemical tempering methods for many decades. ARMOREX<sup>®</sup> was created as the result of fusing fundamental technology accumulated over the years with new experimental results obtained through daily trials and errors. Knowing that "the products we developed are being used in the world, and can contribute to our customers and society" is my biggest reward as a researcher. I want to continue listening to the opinions of our customers, and strive in carrying out speedy research and development.



Yu Matsuda  
Glass Research Center



## To Prevent Global Warming.

Chlorofluorocarbons (CFCs) not only deplete the ozone layer, but also have been considered to be greenhouse effect as one of the causes for global warming. We, Central Glass, are developing products to replace CFCs in products, and providing products to reduce greenhouse effect significantly.

### History of CFCs

CFCs were developed as refrigerants for refrigerators in the first half of the 20th century, and it has been used widely since the middle of the 20th century as a blowing agent for insulation materials and as a detergent for semiconductors and precision parts for its incombustible non-toxic properties. In the latter half of the 20th century, the mechanism behind the ozone depletion by CFCs were found out, and then regulations on specific compounds (CFC, HCFC) which are cause of ozone depletion were tightened by adapting the international treaty "Montreal Protocol" (1987). This led to the development and use of alternative CFCs (HFCs) that do not deplete the

ozone layer. However, next issue has been arisen. This alternative was found to have an extremely high GWP\* that create another big impact on the global environment, and it has triggered tightening of regulations on the use of three alternatives for CFCs (HFCs, PFCs, SF<sub>6</sub>). The above situation has created demand for the utmost effort to reduce greenhouse gases, and technological advances to develop alternatives with extremely low GWP value is a pressing issue.

\* GWP (Global Warming Potential)  
A value that allows comparison of the global warming effect of gases against the standardized value of 1 for CO<sub>2</sub>, for the same weight and time span (of 100 years).

## A Low GWP Blowing Agent (1233E)

Lowering GWP of Blowing Agents Used for Insulating Materials in Condominiums and Apartments.



### Blowing Agents

Blowing agents (CFCs and alternative) are used with urethane resin to create rigid urethane foam for use as insulation materials in buildings, condominiums and apartments. As a manufacturer of blowing agents, our company has been selling alternative CFCs and developing next-generation materials that prioritize environmental friendliness which is required today.

### HFC-245fa Non Ozone Depleting Blowing Agent

The ozone depleting substance, HCFC-141b was used as a blowing agent until 2004. HFC-245fa (hereafter "245fa"), which does not contribute to ozone depletion, was developed and is currently used, and we are the only company that manufactures and sells 245fa in Japan.

### In Pursuit of Low GWP

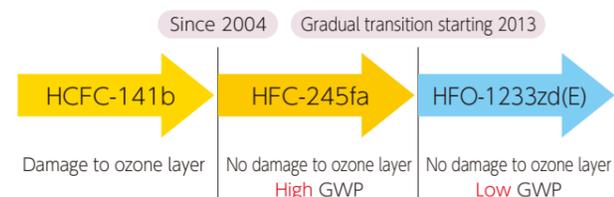
The development of 245fa has solved the problem of ozone depletion, but we have a new need to develop low GWP substances to address the issue of global warming (GWP of 245fa = 1030). Methods of using hydrocarbons and water as low GWP blowing agents have been developed by the rigid urethane industry, but it is not easy for materials made through these methods to achieve the required qualities of insulating performance, workability, economic performance, incombustibility, and etc., and the struggle continues in the

search for solutions.

### Launching of 1233E

Under such circumstances, our company focused on HFO-1233zd(E) (product name at our company, 1233E, hereafter called 1233E). It performs just as well or better than the 245fa that's currently being used, while not contributing to ozone depletion and being a "low GWP product" that has around 1/200 of the GWP (GWP<5) of traditional substances. Preparations for commercialization are currently underway in Japan and other advanced countries as the most promising alternative to HFC-type blowing agents, including 245fa. Our company was the first in the world to have started commercial production of 1233E at the end of 2012. We will now promote the further use of 1233E which is extremely environmental friendly.

#### Changes in Blowing Agents



## New Low GWP Cleaning Gas (CF<sub>3</sub>OF)

Lowering the GWP of Cleaning Gas Used in Semiconductor Production to Virtually Zero.



### Environmentally Friendly Next-Generation Cleaning Gas

PFCs (PerFluoro Compounds) such as C<sub>2</sub>F<sub>6</sub> and C<sub>3</sub>F<sub>8</sub> are being used as cleaning gases in the process of semiconductor production. However, PFCs have extremely high GWP, and their discharge is regulated. So, alternative cleaning gases with low GWP and high performance are being sought after. We began developing a product known as trifluoromethylhypofluorite (hereafter "CF<sub>3</sub>OF") in the latter half of the 1990s, as a next-generation low GWP cleaning gas, and we are at last on the verge of launching it onto the market.

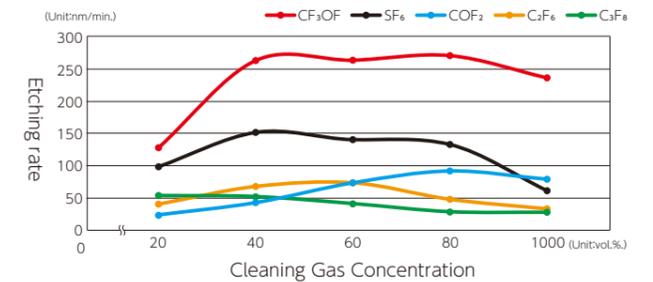
### Three Concepts

CF<sub>3</sub>OF is based on three concepts. The first concept is that it is environmentally friendly. It minimizes generation of discharge-regulated substances, while also being easy to remove them after cleaning.

	CF <sub>4</sub>	C <sub>2</sub> F <sub>6</sub>	NF <sub>3</sub>	CF <sub>3</sub> OF
GWP (CO <sub>2</sub> =1) (100year)	6,500	9,200	8,000	1
Atmospheric lifetime (years)	50,000	10,000	700	0

The second is that it performs better as a cleaning agent compared to traditional ones. Tests carried out at our company showed that it performed about five times better than traditional C<sub>2</sub>F<sub>6</sub> gas.

Results of evaluation tests on the performance of CCP cleaning at our company



The third is that there is no issue on safety or stability of the product. In our test for long-term storage, no change was observed in the composition of CF<sub>3</sub>OF in containers even after several years have passed. It ensures our customers and us of reliability. CF<sub>3</sub>OF has satisfied the requirements of all three concepts.

#### Concepts on CF<sub>3</sub>OF

##### Environmentally friendly

- GWP ≤ 5
- Minimizing generation of PFCs after cleaning
- Allowing low electricity cleaning
- Easy to remove ill substances

##### Outstanding cleaning performance

- High etching rate (high-speed cleaning)
- Enabling cleaning outside the plasma (e.g. inside the piping)

##### Basic performance of gas

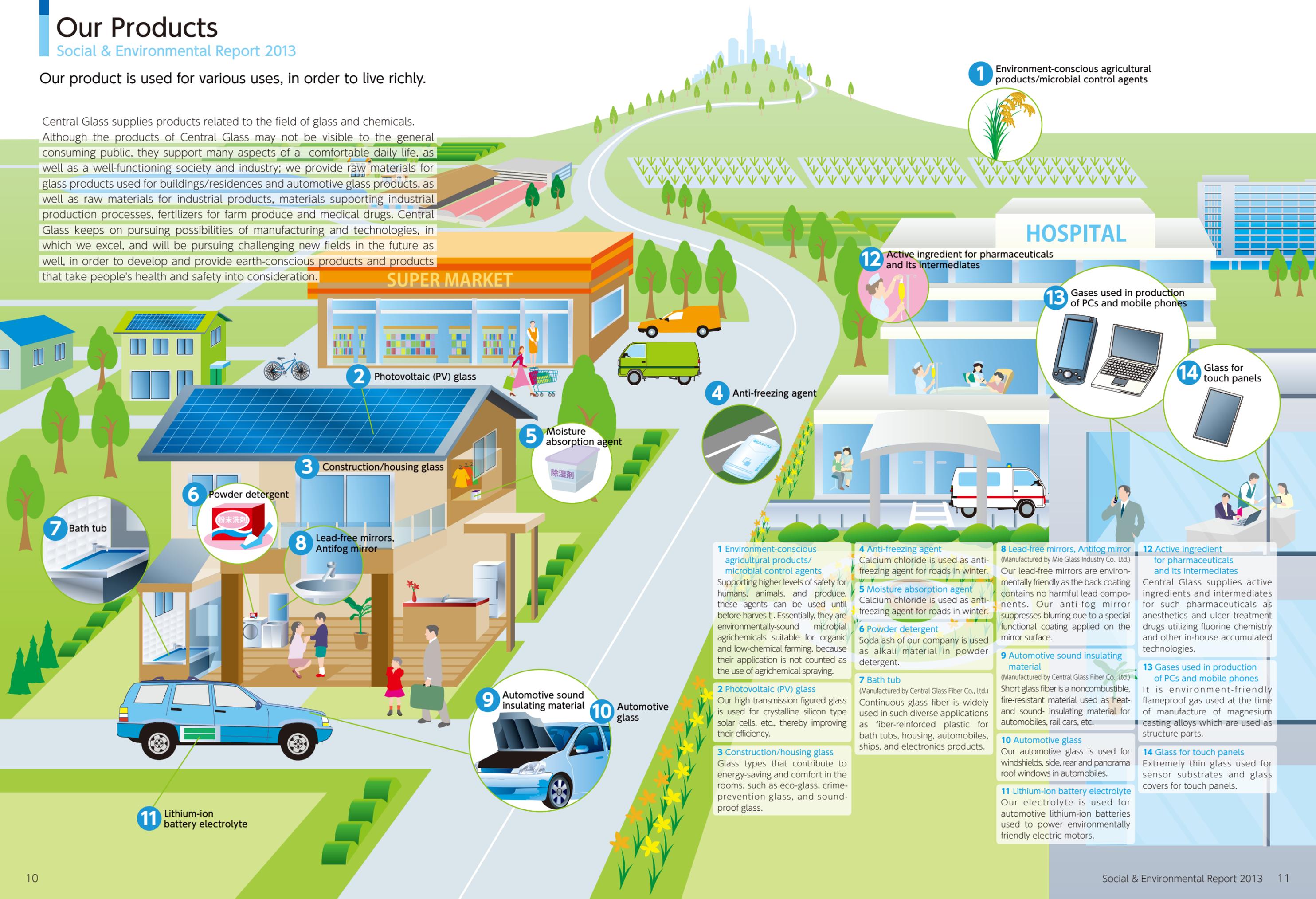
- Safety (for production, storage, transportation and use)
- Stability (for long-term storage)

# Our Products

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Our product is used for various uses, in order to live richly.

Central Glass supplies products related to the field 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 farm produce and medical drugs. Central Glass keeps on pursuing possibilities of manufacturing and technologies, in which we excel, and will be pursuing challenging new fields in the future as well, in order to develop and provide earth-conscious products and products that take people's health and safety into consideration.



**1** Environment-conscious agricultural products/microbial control agents



**12** Active ingredient for pharmaceuticals and its intermediates



**13** Gases used in production of PCs and mobile phones



**14** Glass for touch panels



**2** Photovoltaic (PV) glass



**4** Anti-freezing agent



**5** Moisture absorption agent



**3** Construction/housing glass



**6** Powder detergent



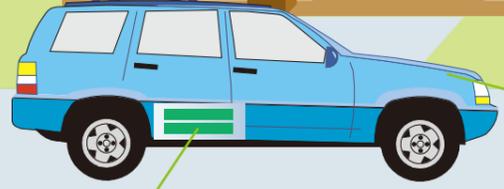
**7** Bath tub



**8** Lead-free mirrors, Antifog mirror



**9** Automotive sound insulating material



**10** Automotive glass



**11** Lithium-ion battery electrolyte

**1 Environment-conscious agricultural products/microbial control agents**  
Supporting higher levels of safety for humans, animals, and produce, these agents can be used until before harvest. Essentially, they are environmentally-sound microbial agrichemicals suitable for organic and low-chemical farming, because their application is not counted as the use of agrichemical spraying.

**2 Photovoltaic (PV) glass**  
Our high transmission figured glass is used for crystalline silicon type solar cells, etc., thereby improving their efficiency.

**3 Construction/housing glass**  
Glass types that contribute to energy-saving and comfort in the rooms, such as eco-glass, crime-prevention glass, and sound-proof glass.

**4 Anti-freezing agent**  
Calcium chloride is used as anti-freezing agent for roads in winter.

**5 Moisture absorption agent**  
Calcium chloride is used as anti-freezing agent for roads in winter.

**6 Powder detergent**  
Soda ash of our company is used as alkali material in powder detergent.

**7 Bath tub**  
(Manufactured by Central Glass Fiber Co., Ltd.)  
Continuous glass fiber is widely used in such diverse applications as fiber-reinforced plastic for bath tubs, housing, automobiles, ships, and electronics products.

**8 Lead-free mirrors, Antifog mirror**  
(Manufactured by Mie Glass Industry Co., Ltd.)  
Our lead-free mirrors are environmentally friendly as the back coating contains no harmful lead components. Our anti-fog mirror suppresses blurring due to a special functional coating applied on the mirror surface.

**9 Automotive sound insulating material**  
(Manufactured by Central Glass Fiber Co., Ltd.)  
Short glass fiber is a noncombustible, fire-resistant material used as heat- and sound-insulating material for automobiles, rail cars, etc.

**10 Automotive glass**  
Our automotive glass is used for windshields, side, rear and panorama roof windows in automobiles.

**11 Lithium-ion battery electrolyte**  
Our electrolyte is used for automotive lithium-ion batteries used to power environmentally friendly electric motors.

**12 Active ingredient for pharmaceuticals and its intermediates**  
Central Glass supplies active ingredients and intermediates for such pharmaceuticals as anesthetics and ulcer treatment drugs utilizing fluorine chemistry and other in-house accumulated technologies.

**13 Gases used in production of PCs and mobile phones**  
It is environment-friendly flameproof gas used at the time of manufacture of magnesium casting alloys which are used as structure parts.

**14 Glass for touch panels**  
Extremely thin glass used for sensor substrates and glass covers for touch panels.

# Corporate Governance and Compliance

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The basic concept behind the corporate governance\*1 of Central Glass is to continually increase transparency and fairness of our overall management, in order to enlarge corporate value, further increase profits, and make efforts to establish an efficient and reasonable organizational structure that can readily respond to changes in the management environment (see the figure below for the specific corporate governance system).

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

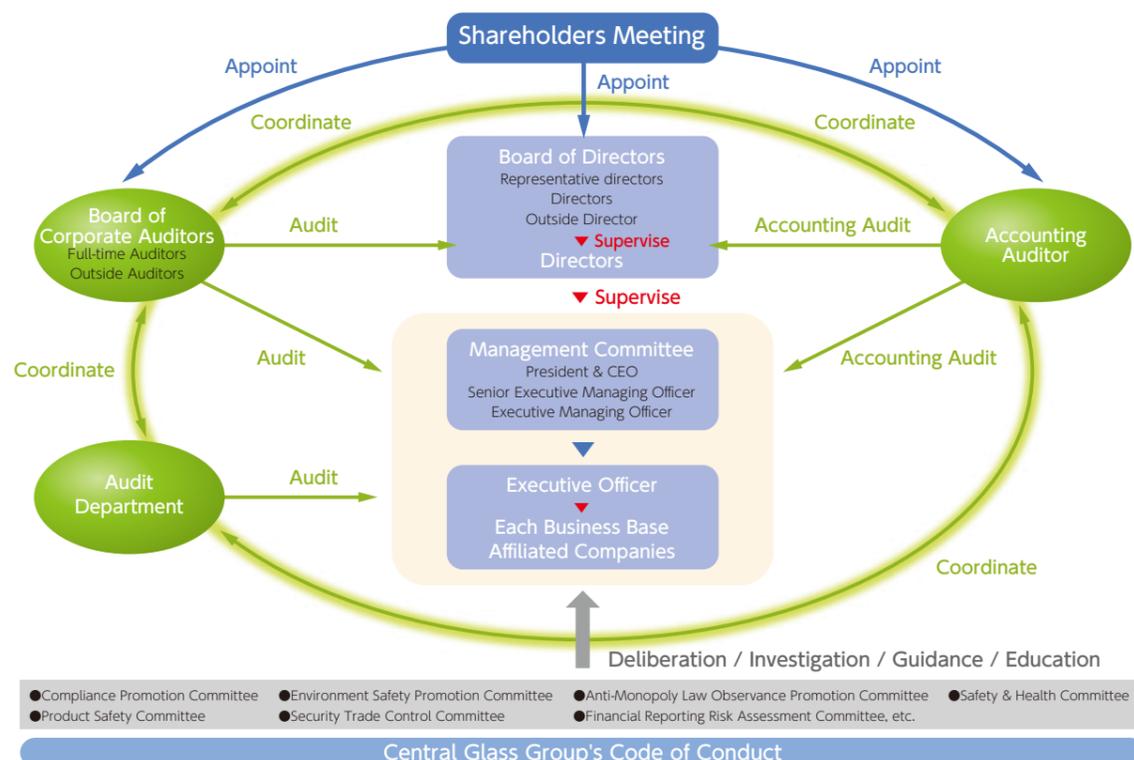
We also created a "Compliance Manual" to serve as a guide on dictating social norms and corporate ethics, and are using it to meet social demands. This manual covers a wide range of fields including, among several others: anti-monopoly law; independence from antisocial forces;

intellectual property rights; regulations on insider trading; environmental conservation; workplace environment; protection and management of information; and respect for human rights. Each item in the manual is reviewed and revised at regular intervals in accordance with the revisions of applicable laws and regulations and trends of social conditions. To supplement this manual, we improve the information by introducing the website of a law book publisher, so as to allow self-examination of questions and problems associated with corporate governance and compliance. Central Glass also established and started the operation of the Whistle Blowing System so that all employees can obtain guidance and consultation on issues and questions concerning compliance and solve them before they become serious.

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, Central Glass Group aims at enhancing both consciousness and implementation of 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.

## Organization Chart for Corporate Governance



# Targets and Progress

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## Mid-Term Targets and Accomplishments in FY2012

Progress: ☀️...Accomplished ☁️...Additional measures required

Item	Major Issues	Mid-Term Targets	FY2012 Results	Ratings	FY2013 Plans	Pages
Environment & safety management	Establishment & maintenance of environmental management system	<ul style="list-style-type: none"> <li>Renewal and maintenance of certification at main workplaces</li> </ul>	Matsusaka Plant and Sakai Manufacturing Site received inspections for changes due to integration of ISO14001 certification. Ube Plant and Kawasaki Plant maintained ISO14001 certification.	☀️	<ul style="list-style-type: none"> <li>Renewal, maintenance and acquisition of certification at main workplaces.</li> </ul>	P.14
		<ul style="list-style-type: none"> <li>Renewal, maintenance and acquisition of new certification at affiliates</li> <li>Enhancement of self-management at non-certified affiliates</li> </ul>	Conducted self-audits based on an environmental safety self-checklist at 26 affiliates.	☀️	<ul style="list-style-type: none"> <li>Renewal, maintenance and acquisition of certification at affiliates.</li> </ul>	P.14
Environmental efforts	Prevention of global warming (energy and resource saving)	(FY2020 target) <ul style="list-style-type: none"> <li>Reduction of CO<sub>2</sub> emissions by 15% from FY 2005</li> </ul>	CO <sub>2</sub> emissions at main plants was 670,000 tons, down 28% from FY2005. Continued participating in trial emissions trading systems at Sakai Manufacturing Site.	☀️	Continuation working on reduction of CO <sub>2</sub> emissions in 2020 by 15% from 2005. Management of energy consumption at a Group-wide scale including affiliates.	P.16
	Enhanced management of chemical substances	<ul style="list-style-type: none"> <li>Promotion of alternatives or detoxification of environmental load substances</li> <li>Asbestos</li> <li>PCBs</li> <li>Other environmental load substances</li> </ul>	Implemented non-scattering asbestos containing materials to remove from manufacturing facilities at the renewal. Completion of final disposal of high-concentration PCBs at Ube Plant.	☀️	Continued removal of asbestos used at workplaces during renewal. Continued strict management of machinery containing PCBs, and their disposal according to local administrative guidance.	P.16
	Reduction of waste	(FY2015 target) <ul style="list-style-type: none"> <li>Reduction of final landfill disposal volume by 65% from FY 2000.</li> </ul>	Final landfill disposal volume of waste at our main plants was 54% down from FY2000. Increased the amount of recycling polluted mud into cement at Ube Plant.	☀️	Continuation on working on reduction of the final landfill disposal volume in 2015 by 65% from 2000. Examination of new technology for reducing wastes.	P.16
Safety efforts	Chemicals and product safety	<ul style="list-style-type: none"> <li>Implementation of appropriate management of chemical substances</li> </ul>	Compliance with the Act on the Evaluation of Chemical Substances, Regulation of Manufacture Industrial Safety and Health Law, and provided the affiliates with relevant information (requiring various submissions). Sequentially improved (M)SDS.	☀️	Continued compliance with laws & regulations and revise our (M)SDS.	P.16
		(Promotion of Green Procurement) <ul style="list-style-type: none"> <li>Implementation of audits on chemical substances</li> <li>Prompt provision of information to customers</li> </ul>	Confirmation of chemical substance management (compliance with laws) and customer response status through an environmental safety self-checklist in Group company wide including affiliates, based on "Green Procurement Guidelines."	☀️	Efforts to reduce the environmental load in products by making a database of information and to provide reliable and prompt information to our customers.	P.16
	Accident prevention	<ul style="list-style-type: none"> <li>Conducting voluntary safety audits on high pressure gas by management</li> <li>Enhancement of proactive measures against disasters</li> </ul>	Periodic inspections carried out by administrations at plants in Ube, Matsusaka, and Kawasaki, and Sakai Manufacturing Site. Conducted voluntary safety audits on high pressure gas. Confirmation of response to emergencies, the management status of lifts and inspection status of power supplying equipment, etc., at Group-wide companies including affiliates.	☀️	Continue to comply with laws, and to hand on safety technologies and know-how. Efforts into establishing equipment safety measures.	P.17
	Occupational safety and health	<ul style="list-style-type: none"> <li>No injury causing lost work hours (trail in various timely measures)</li> </ul>	The frequency rates of accidents that required lost working hours was improved in 2012. They were 0 at our company, and 0.87 at cooperating companies. Both were below average in the industry. Various accident prevention campaigns were carried throughout the entire group.	☁️	Implementation of proactive measures against accident based on analyses results of annual report on a Group-wide occupational accidents.	P.17
		<ul style="list-style-type: none"> <li>Enhance a risk management for occupational safety and health</li> </ul>	Continued to maintain OHSAS18001 certification at Ube Plant. Continued efforts for a risk management system for occupational safety and disaster prevention in Matsusaka and Kawasaki Plants.	☀️	Continuation of initiatives and efforts to spread its implementation at other affiliates.	P.17

# Environment & Safety Management

Social & Environmental Report 2013



## Environment and Safety Management Promotion System

As a company that manufactures and handles glass and chemical substances, Central Glass has introduced a management system based on the principles of

"environmental, health and safety" management activities throughout the lifecycle of products and promotes improvements in this system.

### Environment and safety promotion system



### Environmental Management System (ISO14001)

Ube Plant	Dec. / 2000
Matsusaka Plant	Apr. / 2000
Kawasaki Plant	May. / 2007
Carlex Glass Co.	Sep. / 2001
Apollo Scientific Limited	Feb. / 2012
Yue Sheng Industrial Co.	May. / 2001
Carlex Glass America, LLC	May. / 2012

## Environmental Accounting

Central Glass implements environmental accounting that enables tracking of costs incurred in environmental protection. 580 million yen was invested in environmental protection measures in FY2012, and running cost incurred amounted to 4.218 billion yen. As for the money invested, there was a rise in the cost of measures taken to manage

the improvement of environmental friendliness of plants. As for running costs, there was a decrease in the cost of preventing pollution.

We will continue our efficient investment in equipment to protect the environment, while doing our best to cut costs, and strive in our pursuit of improvement.

### Environmental Preservation Costs

(Unit: million yen)

Article	2012		2011	
	Investment	Expense	Investment	Expense
(1) Business area cost	453	3,444	538	3,811
(a) Pollution prevention cost	211	1,909	237	2,108
(b) Global environmental preservation cost	33	76	62	101
(c) Resource circulation cost	209	1,459	239	1,602
(2) Cost for curving upstream/downstream environmental impact of production and service activities	0	0.1	0	26
(3) Environmental preservation cost associated with management activities	119	273	0	276
(4) Environmental preservation cost associated with R&D activities	9	496	23	367
(5) Environmental preservation cost associated with social activities	0	5	0	7
(6) Cost involved in dealing with environmental damage	0	0	0	0
Total	580	4,218	561	4,487

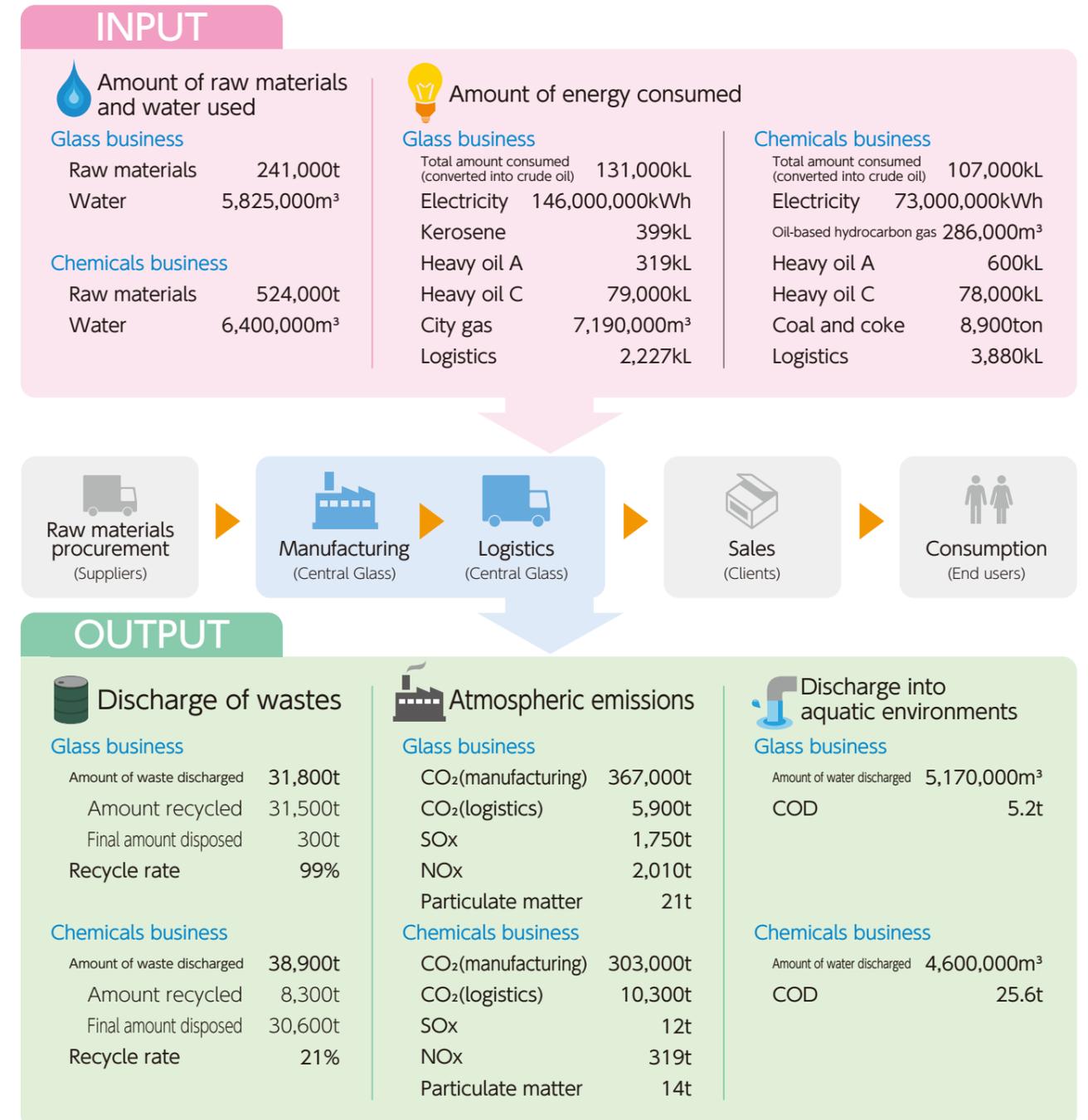
### Environmental Preservation Effects - Environmental Impact Index

Article	Environmental impact substances	Emission in FY 2012 (ton)	Emission in FY 2011 (ton)	Change (%)
Greenhouse gas	CO <sub>2</sub>	670,000	689,000	-3
	SO <sub>x</sub>	1,767,000	1,480,000	19
Environmental pollutants	NO <sub>x</sub>	2,324,000	2,317,000	0.3
	Ash Dust	35,000	32,000	9
	COD	31,000	37,000	-16

## The Flow of Substances at Central Glass

Central Glass quantitatively tracks the environmental impact of manufacturing processes in order to identify environmental issues and implement measures for making improvements in constantly striving to reduce the burden on the environment. A huge amount of heat energy is needed to melt raw materials in the glass business, so it leads the way

in prevention of global warming. The development of environmentally friendly products and reducing wastes are the central issues of the chemicals business, and sustained efforts are being made to cut energy consumption and establish recycling systems.



# Environment

Social & Environmental Report 2013



The fundamental philosophy of Central Glass is based on our environmental principles and code of conduct. Our company, along with all other affiliated companies, 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 development of products to purchasing of raw materials, production, sales, disposal and all other stages in the life cycle of our products.

## Our efforts to prevent warning

We are pouring our efforts into reduction of emission of CO<sub>2</sub>, water pollutants and landfilled solid waste.

### ■ Emission of environmental impact substances

FY	CO <sub>2</sub>	Waste Disposal	SO <sub>x</sub>	NO <sub>x</sub>	Dust	COD	Total Nitrogen* <sup>1</sup>	Total Phosphate* <sup>2</sup>
1990	1,004,000	—	—	—	—	—	—	—
2000	—	67,500	—	—	—	—	—	—
2005	941,000	—	—	—	—	—	—	—
2008	856,000	52,000	2,166	3,717	70	43	56	1.3
2009	642,000	36,300	1,324	2,780	46	35	51	1.0
2010	641,000	32,400	1,277	2,737	48	42	50	1.0
2011	689,000	32,800	1,480	2,317	32	37	44	1.1
2012	670,000	30,900	1,767	2,324	35	31	44	1.0

\*1 means total amount of amino acid, polypeptide, organic nitrogen (i.g. Urea) and protein and nitrogen of inorganic nitrogen (i.g. nitrous nitrogen) in water  
\*2 means total amount of organic / inorganic phosphate in water

## Safety of Chemical Substances

Taking environmental initiatives is now common world wide and the management of chemical substances is not exceptional. Central Glass co-shares data base such as Material Safety Data Sheet ((M)SDS) among parties concerned and works for upgrading technology infrastructure and managing and co-sharing the information of toxicity and risk assessment, in order to manage the risk of chemical substances properly and promote understanding of parties concerned. In addition, we designate persons responsible for management at the plants and research centers where the chemical substances are handled. We implement stricter control on the use and disposal, needless to say, complying with laws and regulations.

In Europe, restriction on used vehicle (ELV: End of Life Vehicle) which concerns the disposal of used cars and Restriction of the use of certain Hazardous Substances (RoHS) which restricts chemical substances used in electric and electronic products were enforced. In addition, we expect a new system, Globally Harmonized System of Classification and Labeling of Chemicals (GHS) to be promoted as a new global rule for the purpose of ensuring health and promoting international transactions. We are progressively working for the GHS as well.

We are storing the PCB-containing equipments under our strict rule based on the law related to PCB, and we are disposing the equipments appropriately in accordance with the law.

### ◆Material Safety Data Sheets (M)SDS

(M)SDS are data sheets designed for the supplier of chemical

substances to provide users with information on chemical substances such as their properties, so as to assure the safety and health of the person handling such chemicals substances. Central Glass also encourages the sharing of information concerning safety on a Group-wide scale by posting (M)SDS on its in-company database.

### ◆The Initiative for Green Procurement

Upon increasing global interest in environment including regulations and other s, we newly prepared "Green Procurement Guidelines". As an initiative on a company wide scale, we request our suppliers to answer the following two survey items for future reference.

1 Whether suppliers have established an environmental management system.

2 Whether raw materials or components purchased contain the voluntarily restricted substances (such as cadmium and others) specified by Central Glass.

In addition, we have established Green Procurement Database and utilize it in order to share the survey results. In the backdrop of RoHS directive in the EU, not only environmental friendliness at the plants but also environmental friendly approach to products themselves is now required. In another word, it is required that procured materials such as upstream materials and components do not contain substances with environmental impact to assure that our products do not contain and incorporate any substances with environmental impact.

# Safety

Social & Environmental Report 2013



## 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 the authorities concerned with the environment, security, and disaster prevention.

At each plants and workplaces, we developed a plan against emergency situations such as earthquakes, fire, explosions, etc. and conduct disaster drills regularly to enhance our employee's awareness to prevent disaster situations. In addition, each department is developing business continuity plans (BCP) to manage business disruption during an

incident and how to return to "business as usual". We continue to act safety-conscious.



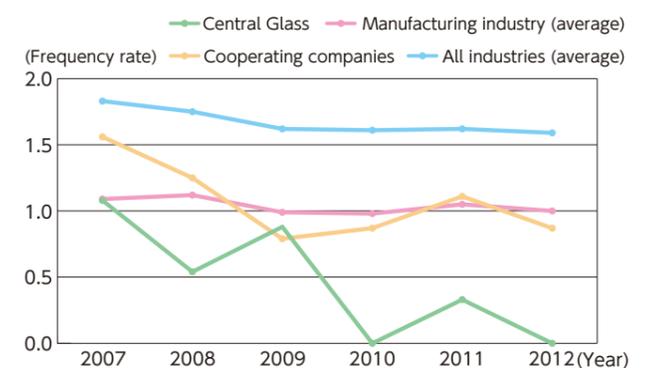
Oil fence exhibition tension (at Sakai plant)

## Occupational Safety and Health

Based on our belief ensuring "safety" is a fundamental principle of all kinds of businesses, occupational safety and health initiatives are being implemented at all plants and offices of the Central Glass Group. Activities continued through FY2012 centered on our safety and health basic policies, such as "reexamination of workplaces," "preparation of an operation manual and thorough compliance," etc. As a result, the frequency rates of accidents that required lost working hours in 2012, at our company as well as at cooperating companies were lowered compared to ones in 2011. Furthermore, both frequency rates were lowered below average in all industries and manufacturing industries. In addition, we called attention to safety measures by holding "Summertime Industrial Accident Prevention Campaign," as well as by issuing a white paper on "Occupational Accident" and awarded "Safety Operation Awards" in 2012 to further motivate the awareness of occupational safety. A characteristic of industrial accidents at our company was it many of them were similar. But in 2012, as the result of steady efforts, we managed to lower the frequency rate of

our most common accident "involving contact with glass" to one third of it last year. We continue our efforts in these initiatives while further bolstering measures to prevent accidents.

### Frequency rate of accidents that require lost working hour



Frequency rate of accidents that require lost working hour  
= (Number of deaths or injured / Total work hours) x 1,000,000  
(The frequency rate of accidents that require lost working hour per one million hours of working hour)

## Logistics Safety

If the accident occurs at the time of transporting chemical substances, it might cause tremendous damage and inconvenience to people in the neighborhood and clients. Central Glass implements periodical training and education not only for its employees but also employees in the workplaces to which we consign transporting in order to prevent accidents in transportation and to minimize the damage if accident occurs. For transportation of chemical substances such as toxic

materials, we prepared an emergency contact card in line with the Logistics Safety Guidelines, to limit the extent of the damage in case of accidents and mandate drivers of relevant vehicle to carry the card. On the card, the measures to be taken and contents to be reported are clarified so that person concerning transportation or person from the fire station or the police station can take an appropriate and prompt action at the occurrence of accident in transportation.



### Regional Dialogue Workshop in the Ube District

The four chemical companies located in the Ube district hold a regional dialogue workshop every year. This year's workshop was held on January 26, 2013 at the Ube Plant, and 61 people from the administration, local NGOs and local citizens participated. An outline of the Ube Plant was explained, and then, participants were taken on a bus tour of the Ube Plant premises. After that, the three participating companies presented their plants and environmental initiatives, while Government of Yamaguchi Prefecture explained about regulations pertaining to industrial complex.

Then participants were divided into two groups based on the two themes, "Managing Chemical Substances" and "Accidents Prevention Measures," and they exchanged opinions. Each groups engaged in spirited debate on each subject, and the local government provided information, thus making this dialogue workshop a very productive one. In order to hear their opinions and to assure them that we are operating in the safest and most secure manner as possible, we intend to continue our communications with the people in our communities.



Presentation by Government of Yamaguchi Prefecture



Meeting to exchange opinions

### Cleanup Volunteer as a Training Program for New Union Members

The Ube Branch of Central Glass Labor Union engages in a variety of volunteer activities to contribute to the local community. Since 2010, with co-sponsored by the company, we incorporated cleanup volunteer into our training program for new union members. Newly recruited members gather from all over the country, and the initiative is intended to familiarize them with city of Ube where they will live, and foster an awareness of deep ties between the company and the local community. Therefore, the cleanup is carried out in the streets, residential areas, parks, etc., around the Ube Plant. During the cleanup, employees enjoy communicating with local residents. By taking part in this initiative, new employees will share a variety of experiences with their colleagues such as the sense of achievement or fulfillment by seeing the huge pile of trash that they gathered themselves. This is an activity that has been incorporated into the policy

of the labor union, and we plan to continue our active involvement on this.



Cleanup volunteer by new employees (Ube Branch)

### 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 Yamaguchi Industrial Promotion Foundation, in the hope of showing children with infinite potential in the future how interesting and fun science can be. In 2012, the 24th "Summer Vacation Junior Science Class" was held in 17 venues in Yamaguchi prefecture, in collaboration with 15 related organizations including universities, technical colleges, and corporate research institutes. We wholeheartedly agree with the premise, and we collaborate actively in holding these classes every year. In FY2012, we held a class in 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 "Let's experience the wonders of heat and light," the children conducted numerous hands-on experiments using household items. Our young engineers played the role of instructors, and the experiments were conducted in small groups so that all children were able to take part in with fun. During the class, the children engaged enthusiastically in the experiments and sometimes gasped in surprise while their parents kept a close eye on them, and many of the parents marveling at the experiments themselves were seen throughout the venue. We hope to be able to continue playing an active role in hosting these classes in the future to provide opportunities for more children to learn how exciting science can be and grow up with interests and curiosities in the science.



During experiments

### Central Glass International Architectural Design Competition

Central Glass has been sponsoring competitions for architectural design ideas since 1966. Since the 10th competition in 1975, it has become International competition as "Central Glass International Architectural Design Competition." to invite entries from overseas. The theme of the 47th competition in 2012 was "Town Hall in a Regional Environment". There were 428 entries in total, 294 entries from Japan and 134 from overseas. (refer to the back cover for the

First Prize design.). The theme of the 48th International Architectural Design Competition in 2013 is "Bringing the Urban Environment into Architecture." We live in the time in which we need to pursue economic efficiency and rationality, while preserving the natural environment and protecting historical and traditional culture. As a company that promotes architectural culture, we believe that it is highly meaningful for us to provide occasions to consider a desirable society and environment through this competition. We take a great pride for our continuing efforts to sponsor this competition for many years.



Award ceremony after final screening (First Place Prize)

- Chief Judge:**  
Riken Yamamoto (Riken Yamamoto & Field shop)
- Judges:**  
Kiyoshi Sakurai (Nikken Sekkei Co., Ltd.)  
Taro Ashihara (Taro Ashihara Architects)  
Teruo Kobayashi (Obayashi Corporation)  
Hiroshi Naito (Naito Architect & Associates)  
Kengo Kuma (Kengo Kuma & Associates)  
(Titles omitted, listed in random order)

### Cooperation and Aid

2 million yen was donated to the NPO, People's HOPE Japan, to fund surgeries for heart diseases (ongoing support)

Over 113 thousand yen donated in a campaign to aid atomic bomb survivors (Ube Branch, Central Glass Labor Union)

# Employees

## Social & Environmental Report 2013



### Employment of Disabled



Cleaning cover sheets on products

At the end of FY2012, the rate of employees with disabilities stood at 2.03%, more than the stipulated rate, 1.8% by the law. As part of this initiative, a new practical training facility was established at Ube Plant to

We, Central Glass, consider employment of disabled people to be one of contributions we can do to society, and we take a proactive stance on this initiative. As of the end of FY2012,

allow people to undergo prior job training for enabling them to enter the work environment smoothly. We not only promote hiring disabled people, but also strive to improve the overall work environment throughout the company and to make it barrier-free atmosphere. We will continue our active engagement in these initiatives to allow disabled people to enjoy their work unrestrained.



Practical training facility

### Studying Program

We provide internal training programs such as OJT and group training sessions and studying programs in which employees are dispatched to domestic and international educational institutions. This is carried out with the aim of fostering specialists with a high level of expertise, and a number of people are dispatched to MBA or MOT programs every year.

The objective of our MBA studying program is to train candidates for high-level executive positions in our company, on whom the future growth of the company will depend. They foster strong motivations and aspirations, and they study over two years to learn business administration and ways to make objective judgments and to use their imagination systematically.

The objective of the MOT study program is to cultivate human resources who will contribute to boost the corporate value by promoting strategic research and technology development through their thorough understanding of both

technology and business administration.

We also have short-term study abroad programs that aim to improve practical skills in foreign languages and cultivate global perspectives. This initiative aims to foster human resources that will lead the way in our global expansion.



Short-term study abroad program to India

### Interview with MBA Studying Abroad Program User

The U.S. MBA program that I took part in was for two years (full-time), and there were around 270 students in a school year. 70% of them were Americans, and the remaining 30% were from all over the world. The program was composed a well-balanced mixture of lectures, discussions, and group works. We received assignments to work on individually or in groups. At the beginning, I was overwhelmed by huge quantities of readings, classes progressing at a rapid speed, and discussions in English with fellow students who have all different cultures, languages, careers and backgrounds. But by the time I was about to graduate, I became to handle my assignments such as writing reports and discussions in class. The two years of the MBA program provided me with a priceless experience and opportunity to acquire knowledge on finance and global expansion, which I had lacked, and to acquire global communication skills. I would like to make use of this experience to become an asset to our company for further globalization.



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