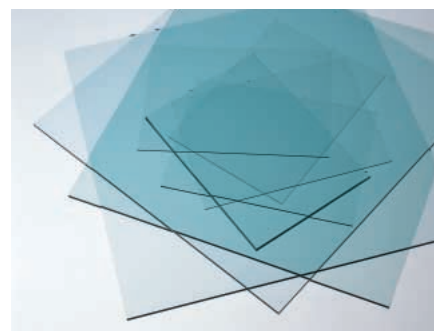


ASAHI GLASS ENVIRONMENTAL REPORT 2003



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Introduction

This environmental report reviews environmental activities in FY2002 of Asahi Glass Company (AGC) Group. Statistics presented in this report are unconsolidated data of Asahi Glass Co., Ltd., as of March 2003 and compiled as of July 2003. Unless noted otherwise, they are not for AGC Group.

Unless specified otherwise, the year presented in this report represents the fiscal year beginning in April and ending in March.

"Environmental Reporting Guidelines (Fiscal Year 2000 Version)" and "Environmental Performance Indicators for Business (Fiscal Year 2002 Version)," issued by the Ministry of the Environment of Japan, are referenced in this report. "Sustainability Reporting Guidelines 2002" (Global Reporting Initiative) is referenced for "Relation Between Asahi Glass and Society," a new undertaking for this fiscal year. Financial information, economic performance, and related figures are included in the annual report. For details, please see Asahi Glass Home Page at www.agc.co.jp/english. For environmental report preceding 2002, please see the Asahi Glass Home Page at webpage www.agc.co.jp/english/environment/book.html. AGC Group products in this report are representative examples. For details, please see the Asahi Glass Home Page. No part of this report is to be reproduced in any form without the express permission of AGC group. All rights reserved.

Asahi Glass Home Page
URL <http://www.agc.co.jp/english>

Asahi Glass Environmental Report Home Page
URL <http://www.agc.co.jp/english/environment/book.html>



Shinya Ishizu
President & CEO

A handwritten signature in black ink that reads "Shinya Ishizu". The signature is fluid and cursive, with the first name "Shinya" and last name "Ishizu" clearly distinguishable.

Message from the President & CEO

As the "century of the environment," the 21st century places a border-spanning global focus on environmental issues such as global warming, depleting the ozone layer, and the depletion of natural resources. With business activities becoming increasingly international and global, enterprises are being called upon to solve these problems in a global framework to conserve the irreplaceable environment for future generations.

In April 2002, AGC Group formulated "**Look Beyond**" a new group vision targeting a truly global enterprise. In this light, "We, as good global citizens, will shoulder the responsibility to contribute to a sustainable society in harmony with nature." AGC Group thus promotes environmentally aware management global in scope.

AGC Group is now engaged in integrating environmental management, expanding the focus on environmental management from a nonconsolidated individual enterprise to that of a consolidated group basis. This will provide a solid base for attaining the goals of global environmental management. To improve our corporate value compatible with both management and the environment, we are developing policies for promoting environmental business, maintaining infrastructures, and improving information disclosure. In addition to these undertakings, the Group will continue to positively pursue previously set goals of creating a sustainable society through measures against global warming, reducing waste, and recycling resources.

As one of the leaders in basic materials, we are dedicated to implementing effective environmental measures ahead of competitors.

This report reviews the environmental achievements of AGC Group. Our greatest reward will be in knowing that our readers will have found this report both interesting and informative.

Any opinions or comments you may have regarding this report would be most highly appreciated.

October 2003



Environmental management is the strategic nucleus of future management

AGC Group's environmental activities appear in all aspects of group operation, from the overall vision to the precise business implementation plans. Hajime Amemiya, General Manager of the Corporate Environment & Safety Directorate, throws new light on the group vision and plans in the interview.

Hajime Amemiya,
Senior Executive Vice President,
General Manager
Corporate Environment & Safety
Directorate

Interviewer
Osamu Murakami,
Chief Researcher
Center for Environmental
Information Science

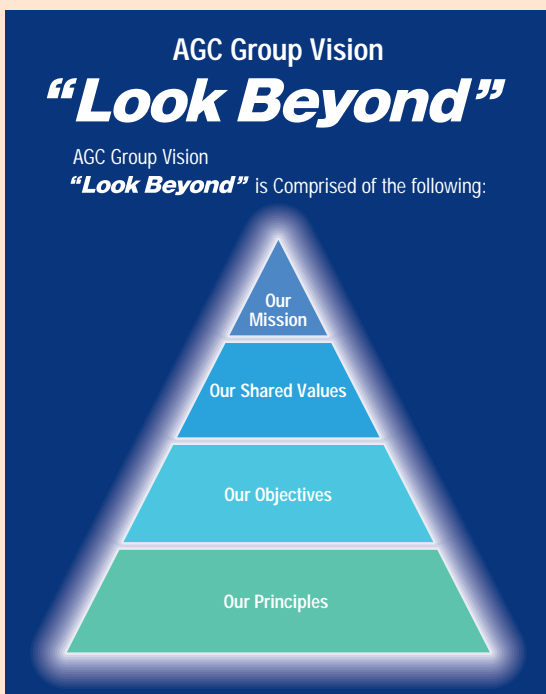


“Look Beyond” —the global vision of AGC Group

Murakami: Documents show that AGC Group (“the Group”) has already put out its environmental views in the group vision of “Look Beyond”

Amemiya: You’re right. We must apologize that “Look Beyond” has a large number of English expressions, which can’t be avoided in view of our businesses expanding on a global scale. The vision is, first of all, “Our Mission” defining the very significance of the Group’s existence,

and, as it were, our constitution describing “Our Shared Values,” “Our Objectives,” and “Our Principles.” Among the values we must share are “Innovation & Operational Excellence.” Furthermore, there are three pillars that support the Group: “Environment,” “Diversity,” and



AGC Group vision controls actions from our mission to our principle

AGC Group has come up with the global group vision “Look Beyond” in order to meet the ever-changing business environment. The vision stream controls “Our Mission,” “Our Shared Values,” “Our Objectives,” and “Our Principles.”

“Our Mission” implies “We, “Look Beyond” to make the world a brighter place.” In order to realize this mission, “Our Values” must be shared by all members of the Group as the basis of every action we take. In this respect, “Innovation and Operational Excellence,” is set up as the source of the Group’s competitive advantage. Three shared values are further added to support the aforesaid value. They are: “Environment” “Diversity,” and “Integrity,” which are set in order that the Group could gain trust from the global community to achieve success, and to create a healthy global environment and sustainable society as a corporate citizen.

“Our Objectives” aim at excelling as a highly profitable and fast-growing global enterprise by concentrating business areas to maximize group value, enhancing competitiveness and implementing management by our global teams. “Our Principles” stipulate the actions to be taken by our employees. (The contents of “Our Principles” are given on Page 26.)

Our Shared Values that support "Look Beyond"

Our shared values are declarations of values all members of the Group must share as the basis of every action we take.



"Integrity."

Murakami: Could you please tell us the background of how AGC Group vision "Look Beyond" came into being?

Amemiya: Asahi Glass will celebrate its 100th anniversary in 2007. There are 50,000 employees in AGC Group working under mid-term plans made by the respective business units throughout the world. Under such circumstances, we simply wanted to make it clear where Asahi Glass or the Group should head for, with what vision. First of all, we had our employees in their 30s and 40s discuss this, and on the basis of their discussions we kept on studying various angles until we came up with the vision "Look Beyond" that captures and expresses foresightedness, a wide view and breakthrough sense of the status quo.

Murakami: We can see that you are trying to be flexible toward the environmental issue, but I'm afraid, "Diversity" may be a little difficult for an outsider to understand.

Amemiya: The term "Diversity" came from the reflection that a company can hardly be called global simply because it is expanding its businesses throughout the world. There are different peoples with a diversified sense of values,

respecting the culture of one another. On top of it, a unifying force gets activated to give rise to a sense of unity as an enterprise. I think that is a global company in the true sense of the word. For example, from the standpoint of Japanese values "A" is the solution to a problem, but when European or American values are taken into account, "B" may prove the true solution. When this happens, we will change our mind in a flexible and courageous manner. That's what we mean by "Diversity." In fact, however, there are values that are not so easy to share. But we ventured to put up this value as the Group aiming to become a global enterprise. Our third item, "Integrity," can be interpreted as the "sincerity" of an enterprise. This also works as a brake against the "business for profit's sake" that solely aims at making profit regardless of the means in doing so.

Basic AGC Group Policies on Environmental Conservation

Murakami: The spirit of "Environment" appears to have spread throughout the Group in recent years. Could you please throw light on your Environmental Policy in relation to the "Environ-

ment?"

Amemiya: Environmental Policy starts with the recognition and self-awareness that the Group is an enterprise producing relatively large environmental burdens. This in mind, we began to think what we could, or rather, should, do. Some people interpret the environmental activity of a company simply as reducing public hazards, but we don't agree with such a passive way of thinking. A company has an intrinsic and positive role in creating value through its products, technologies, and services.

Murakami: Do you think of spreading that concept to in-house companies business units and other affiliates?

Amemiya: We think there is no other way but to keep on sending a message from top management taking all possible opportunities. We keep on providing information in various forms regarding the "reason for establishing Environmental Policy" and the "reason why the Environmental Report is published every year" to let each member come to share the very core of the concept.

Murakami: Could you give us an example of the environmental awareness of employees being reflected on the product?

Amemiya: Glass substrate for liquid crystal displays that contains no arsenic is a good example. Because of its dramatic effect on quality improvement, arsenic had been used by all major producers. However, when glass substrate containing arsenic is subjected ↗

to chemical treatment, the wastewater may include arsenic, which is a serious problem indeed. We do not produce that kind of products. That's why I think our product (arsenic-free glass substrate) has provided our customers with unprecedented value. This may ↘



We feel proud in being a green supplier.

be likened to the filter for removing soot and smoke produced by a diesel engine, infrared-ray cut glass for automobiles, and the like. We would like to promote with pride the development of products that pay due attention to the environment.

Mid-term management plan "StoG2005" as an Action Plan to realize the Group Vision

Murakami: We understand that the term "Shrink to Grow" is the development of the vision into management strategy, and the mid-term plan for the next three years is "StoG2005." We

guess there are some key environmental policies included there. What do you think will be the main policy in "StoG2005"?

Amemiya: The first, I should say, will be measures for purifying the soil and groundwater contamination at our Chiba Plant. The second will be our efforts toward the achievement of zero emission by 2005, the third will be the reduction in the emission of greenhouse gases such as CO₂, HFC, and SF₆.

Murakami: Could you cite a key policy in this regard, particularly for the first year, 2003?

Amemiya: We intend to promote global integration of the Environmental Management System (EMS), first through integration in nonconsoli-

dated Asahi Glass followed by global integration. However, each plant or affiliate has its own individuality, which is considered as, a culture as well. That's why I don't have the faintest intention of standardizing plants or affiliates.

Murakami: It appears necessary to communi-

Vision and Mid-term Management Plan:

- Vision "Look Beyond": Future direction of the Group
- Shrink to Grow: Business selection and concentration in accordance with the vision
- StoG 200x: Mid-term (3 years) management plan (rotating every 2 years)



— **"Look Beyond"** →

Shrink to Grow

Develop an Optimum Portfolio → **Shrink** Reform Management System

Focus on Growth → **Grow**

'00/3 '01/3 '02/3 '03/3 '04/3 '05/3 '06/3 '07/3 ...

StoG2001

StoG2005

StoG2003



cate with stakeholders regarding the environmental aspects of putting the business plans into practice. How do you make communication, for example, with your customers?

Amemiya: We take pride in being a green supplier. As for an individual product, for example, we determine whether the product involves any risk or not, and include a Material Safety Data Sheet with the product. We spare no pains in bearing the responsibility for explanation, and consider it more important than anything else.

Murakami: Hearing you, I feel that directivity of

environmental activity is becoming clearer and clearer year by year. How is the reaction inside the company?

Amemiya: To tell you the truth, that may be counted as one of our greatest achievements. The people in charge of plants, such as General Manager, have shown a change in their awareness. Their deep recognition of the environment is nothing but desirable.

Murakami: What part of this Environmental Report would you like readers to pay particular attention to?

Amemiya: We would like readers living near plant to read through the page describing the involvement of the plant or the affiliates. Our environmental activities do not necessarily flow in one direction, from top to down. In order to make the policies of the Group Corporate, the people in the front line at the work site are mustering their originality and ingenuity fitting their actual condition. This eventually leads to special characteristics and originality of the plant or affiliates. By the time you've read through this page, I'm sure you will come to understand our activities, and in addition to this, it would be highly appreciated if you took into consideration the efforts made by people at the work site.

AGC Group's Environmental Policy

The principle upon which AGC Group engages in environmental management activities is as follows: Active contribution to environmental conservation is a fundamental responsibility of enterprises towards global society. This principle is implemented in the following environmental management activities:

1. We are committed to the conservation of the environment as a top management priority in all our corporate activities.
2. We will make every effort to establish the environmental management organizations and systems and to work for continuous improvement.
3. We will comply with laws, ordinances, regulations, treaties, and agreements designed for environmental conservation. We will also set and work to achieve voluntary targets to reduce environmental impact.
4. We will work to develop and provide society with products, technologies, and services that reduce environmental impact.
5. We will publicize our overall environmental activities to ensure that they are properly understood by society.

Major Environmental Activities in StoG 2005

AGC Group aims at attaining the top global capacity in the fields of environmental conservation, occupational health and safety, security and accident prevention in the glass and chemical industries.

Basic Policies for 2005

1. Against the social background and the changes and diversification of business in the company, Corporate Environment & Safety was reorganized on April 1, 2003 as an independent corporate office, group of experts and specialists. The new organization will also simultaneously carry out the tasks of the Secretariat to the Directorate.
2. In order to carry out the tasks of environmental safety and maintenance smoothly, AGC Group will regulate and clarify the business responsibilities and authorities of Group Corporate, In-house Companies, Strategic Business Units (SBUs) including major domestic affiliates, plants, and branch offices. This will be eventually followed by appropriate execution of tasks by each member of the Group, while keeping effective mutual cooperation.

Main Missions of the Corporate Environment & Safety

Planning and drafting of basic policies and strategies regarding the Group's environmental conservation, occupational health and safety, security and accident prevention, taking into consideration the intentions of top management. Disclosure of these plans and drafts to each in-house company, main affiliates in Japan and other concerned people in addition to audit, control and support for their implementation, aiming at making the activities of the Group unified.

Important Measures regarding Environmental Activities in the "AGC Group Environment and Safety Management Plan" (2003)

(To be expanded basically on a global scale)

The Corporate Environment & Safety will take a leading role in promoting the build-up and consolidation of the system and disclosure of information.

1. System consolidation
Integrated management system being built up at Asahi Glass (including acquisition by the Head Office). Registration of certification targeted by the end of 2003.
Support to affiliates of the Group for upgrading and obtaining ISO 14001 certification
2. Information disclosure
Start of study on sustainability report expansion of Environmental Report in Japanese/English.
Continued holding of "AGC Group's Environmental Forum"
Promotion of environmental communication with stakeholders
3. Measures to be promoted mainly by in-house Company and major affiliates in Japan
Environmental accounting assessment and feedback to management
Green procurement
Green Purchasing (stationery, OA machines, etc.)
Activities for Life Cycle Assessment (LCA)
Fostering of environmental business
Environmental measures at the Logistics Section
4. Items to be carried out by plants and domestic affiliates under the guidance of in-house Company and major affiliates in Japan
Counter activities against soil and groundwater contamination
Attain zero emission targets set for the end of 2005
Measures against greenhouse effect (global warming), energy-saving measures and emission reduction of HFC, SF₆, and CO₂
Appropriate control and reduction in emission of chemical substances, reduction in emission of hazardous substances in atmosphere and water

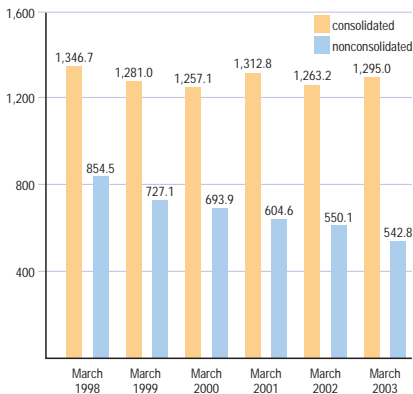
Company Profile

Asahi Glass Co., Ltd. has affiliated or related companies not only in Japan but in 24 countries all over the world, and all these companies are designated by the general as AGC Group.

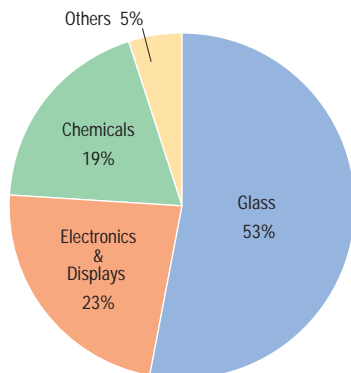
AGC Group aims at becoming an excellent global enterprise with high revenue and high growth as a manufacturing and sales establishment of materials and parts, with the core technology in glass and fluorochemicals, etc. Thus the Group has a basic management policy of sustainable improvement in enterprise value, aiming at its members gaining top positions in their respective fields.

Among the affiliates of AGC Group, 50 companies (mainly the major manufacturing companies) that have comparatively high environmental impact are labeled as companies requiring environmental activities control in order to carry out environmental activities collectively as AGC Group.

Change in Sales (billion yen)



Sales per Business Field (for March 2003)

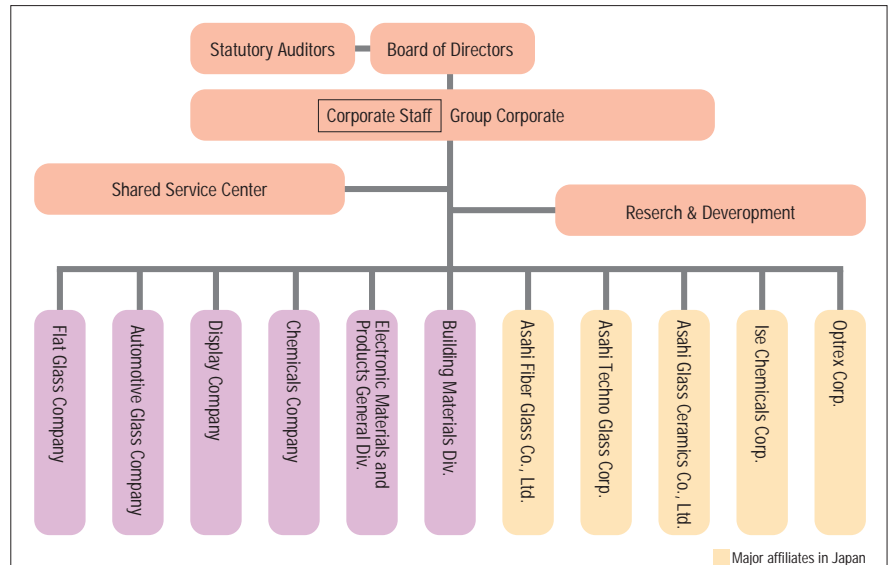


Corporate Information

(As of March 31, 2003)

Name: Asahi Glass Co., Ltd.	Paid-in capital: ¥90,472 million
Head Office: 1-12-1, Yuraku-cho, Chiyoda-ku, Tokyo 100-8405 JAPAN	Stocks issued : 1,175,242,497
Date of establishment: September 8, 1907	Number of employees (nonconsolidated): 6,334
Date of incorporation: June 1, 1950	Number of employees (consolidated): 53,728
President & CEO: Shinya Ishizu	Number of consolidated affiliates: 213
	Number of unconsolidated affiliates: 114

Outline of Organization and Enterprise:



Business fields	Companies/ Major Affiliates in Japan	Principal Products
Glass	Flat Glass Company	For building Float glass/Double-glazing glass/Figured glass/ Wired glass & lined glass/Heat-reflective & absorbing glass/ Fabricated glass for construction/Mirror
	Automotive Glass Company	For automobile Laminated glass/Tempered glass
	Building Materials Div.	Others Exterior siding boards
	Asahi Fiber Glass	Glass fibers
	Asahi Techno Glass (related to glass)	Specialty glass, such as fluorescent tubes
Electronics & Display	Display Company	Display CRT CRT glass FPD TFT LCD glass/PDP glass/TN,STN LCD glass
	Electronic Materials and Products General Div. Asahi Technoglass (related to electronics) Optrex	Electronic Materials Optoelectronics/Frit and paste semiconductor-related products Medium to small size TN,STN LCD
Chemicals	Chemicals Company	Fluoro-Chemicals Chlor-Alkalis Urethanes, etc. Fluorinated resins,gases and solvents, water and oil repellent agents/ Ion-exchange membrane/Pharmaceutical intermediates and bulks Soda ash/Caustic soda/Caustic potassium/Hydrochloric acid/PVC
	Ise Chemicals	Iodine related products
Others	Asahi Glass Ceramics and others	Ceramics related products and others



Business Introduction

Asahi Glass started business in flat glass, and has expanded it to the fields of chemicals, automotive glass, and so on. The company is now supplying its customers with different products also in advanced technology such as computers, etc. Introduced below are the profiles of In-House Companies, General Division and Division as well as their major products.

Flat Glass Company

Under the unified global management system started in April 2002, the Flat Glass Company now has about 40 float furnaces operating around the world and well advanced in full automation, IT and energy-saving produce glass (Global market share: approximately 20%), the main flat glass for building. Float glass manufacturing enables production of glass differing in function, such as heat-absorbing flat glass, high-transparent glass, etc., simply by changing the material composition.

The secondary process of flat glass has a wide

range of products such as tempered glass, laminated glass, and double-glazing glass in addition to various other products with their function and design improved through different surface treatments. "Excelsior™", made up of Low-E (low-emissivity) pair glass and high-insulation sash, ensures about threefold the heat insulate effect of a window made of single-sheet glass. This helps reduce power consumption for cooling and heating, contributing to the reduction of CO₂ emission from power plants.



With "Excelsior™", users can freely combine window glass functions such as heat insulation, crime prevention, and sound-proofing. It also helps cut down CO₂ emission for cooling and heating.

Automotive Glass Company

The Automotive Glass Company supplies a large number of automobile makers both in Japan and abroad mainly with improved safety and design-flexibility by using high-quality float glass. One-third of cars worldwide adopt "AGC" products. Laminated glass for windshields, the representative product of "AGC," is produced by laminating soft flexible plastic film between two sheets of bent glass under high temperature and high pressure. A large number of high-function products (infrared-ray cut glass, UV blocking glass, low-reflection glass, water-repellent glass, and glass antennas, for example) have been devel-

oped to meet customer needs for "creation of a comfortable mobile space" and "strengthening of functions complying with environmental needs."

The company's engineering technology for making complex three-dimensional shapes through deep bending by making effective use of computers is ranked top in the world. The Automotive Glass Company has production plants in 18 countries, and, like the Flat Glass Company, adopts a unified global management system.



Windshields without water-repellent finishing (top) and with water-repellent finishing (bottom), showing water drops being repelled naturally to ensure a clear view.

Display Company

The Display Company has two manufacturing divisions. One is the CRT Glass General Division that manufactures cathode-ray tubes for televisions and computers. This division leads the world in development and technical manufacturing involving complex processes. With screens becoming larger and flatter, the company has become successful in mass production of lightweight flat panels.

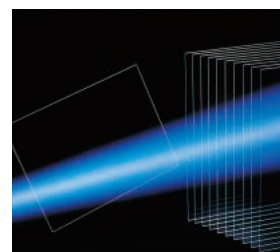
The other division is the FPD* Glass General Division. FPD refers to liquid crystal and plasma displays, and its application ranges widely from

information and communication devices to OA, AV devices, and electric home appliances, with promising future growth.

Our FPD glass substrate does not use arsenic, and is widely described by the customers as "environment-conscious glass." The company is the only one to use the float process in manufacturing nonalkaline glass for LCDs. We are confident of our manufacturing methods, technical innovation at our production site, and thin film formation technologies.



Flat panel "TLIPRED™" using glass tempering technology and three-dimensional simulation



The Display Company is the only one in the world to manufacture nonalkaline glass for LCDs with float process. Our technology for developing high-performance glass friendly to the environment is ranked top.

*FPD : Flat Panel Display



Chemicals Company

The Chemicals Company manufactures products to comply with customers' needs under the slogan of "supplying materials and solutions." We have two business fields. One is commodity chemicals, including general industrial chemicals mainly chlor-alkalis that can also be used as glass materials. The other is specialty chemicals including special chemicals such as pharmaceutical intermediates chemicals. We are expanding our business in the fields of energy, electronics, displays, and life science, the business concerned mainly with fluorine and urethane-related technologies.

In fluorochemicals, we aim at becoming a world leader in our target field in the world market, with fluoropolymers as the key product which has a global network established in Japan, Europe and North America. The fluorinated solvent, "ASAHI-KLIN™ AK-225" with low Ozone Depletion Potentials, is highly rated as a new product to comply with new environmental needs. A great number of our other specialty chemicals are being widely used in many advanced fields, such as high performance fluorinated resin for display-related PDP optical filters.

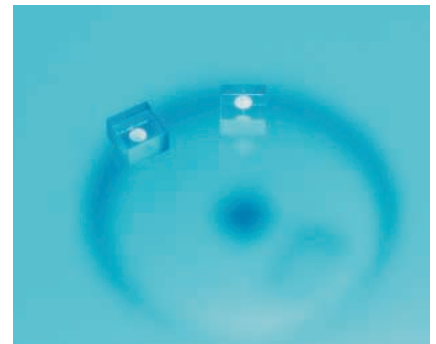


Left top: Molded fluoropolymer products
Left bottom: Baking powder products "ECOKIDS™" attracting attention as a kitchen detergent
Right: Next-generation fluorinated solvent "ASAHIKLIN™ AK-225"

Electronic Materials and Products General Division

The Electronic Materials and Products General Division combines the various core technologies fostered and developed in the glass business, display business, and chemicals business, and makes use of this engineering mix to produce various materials, parts, and functional parts to electronics-related industry, etc. For instance, in the field of optoelectronics, we manufacture optical planar devices for pick-up of DVD/CD and diffraction gratings for optical telecommunication. In the field of semiconductor manufacturing equipment, we offer stepper lens materials used for making fine and high-quality circuits with a

width of less than 1/4000th of 1 millimeter of an IC chip that is the source of computer core and synthesized quartz glass parts such as photomask substrates, etc. We also manufacture special parts such as wafer boats, and inner tubes made of high-purity Silicon Carbide. The Division also manufactures high-density circuit boards and frits and pastes (application of glass powder through effective use of composition design, melting, and grinding technologies).



Optical planar devices for pick-up of DVD/CD. It is a high-precision part made by overlapping 8 layers of materials at a thickness of 0.5 mm using advanced technology.

Building Materials Division

The major product of the Building Materials Division is exterior siding boards for housing "AG-WALL," excellent in design and fire resistance. "AG-WALL" was developed on the basis of glass-fiber reinforced cement (GRC) technology, with the main materials being cement material available in nature and glass and organic fibers harmless to human health. Further, paying attention to adverse effects on human health and the global environment, the use of organic solvent in paint is avoided, and instead, water-based paint is used. We use two kinds of manufacturing processes: high-product-

tivity high-speed, single-layer fabrication and high-design, integrated fabrication suitable for sharp and irregular products, in great demand in recent years. In addition, as a company promoting recycling of building materials, we have received the designation of a specified industrial waste treating company for wide-area recycling from the administrative authorities, and have an established system of recycling leftover materials collected from each area in our plant.



The exterior siding boards "AG-WALL" is excellent in fire resistance, heat resistance, and dew resistance in addition to having high permeability and light weight. Since it makes use of recycled material, it helps to reduce environmental burdens.



Research and Development Technology Friendly to the Environment

Asahi Glass offers a variety of environment-conscious products using our up to date technologies of arsenic-free glass, infrared-ray (IR) cut glass, solar cells, and so on. Among these, the technologies that are currently drawing attention are introduced below.

Clean Energy

Development of parts for fuel cells currently drawing attention as next-generation energy

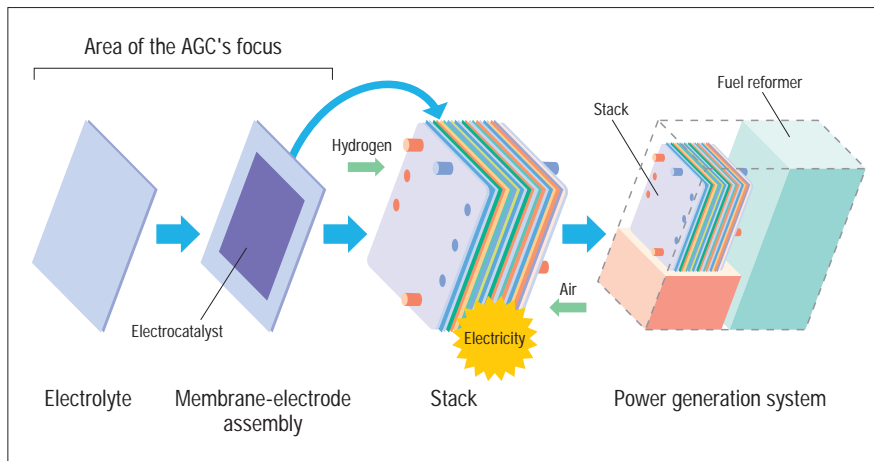
Fuel cells are drawing attention as clean energy with no emission of CO₂ to cause global warming. The mechanism is to bring fuel in contact with a special catalyst formed on electrolyte film to separate hydrogen into hydrogen ions (H⁺) and electrons (e⁻), while remaining hydrogen ions pass through the electrolytic membrane

and combine with oxygen (O₂) in the air and the electrons that returned after being used to precipitate water (H₂O).

Currently, the emission of CO₂, particularly from automobiles, is considered as one of the causes of global warming, which has kicked off the development of cars with fuel cells using hydrogen.

Asahi Glass has developed a part for fuel cells called a membrane-electrode assembly com-

posed of Flemion™ membrane and catalysts. Electrons are not removed unless the membrane-electrode assembly activates normally, and the product then cannot be used as a fuel cell. It is a core part. We are developing fuel cell parts on the basis of the technology obtained through fluoropolymer ion-exchange membrane used for the manufacture of caustic soda.



The "membrane-electrode assembly" is produced by integrating membrane and electrocatalysts. This part is sandwiched by separators and then piled repeatedly in multilayers makes an assembly called a stack. This stack, when combined with peripherals, makes a fuel cell system.

Prevention of Air Pollution

Development of diesel particulate filter to prevent emission of soot and smoke from diesel engines

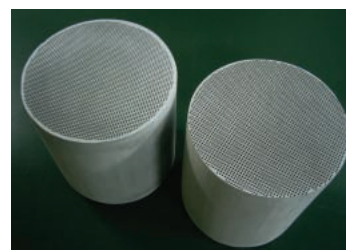
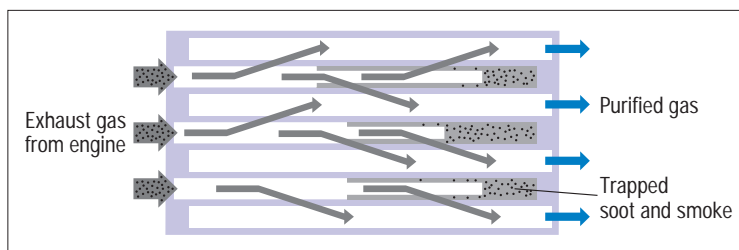
We have developed a ceramic diesel particulate filter used for purification of exhaust gas from diesel engines. The ceramic filter is provided with a large number of fine holes using our unique technology.

When diesel exhaust passes through this filter,

soot and smoke is trapped to the ceramic wall, allowing only clean gas to pass through.

With excellent fuel consumption and CO₂ emission being lower by 30%, diesel engines are still highly popular, mainly in Europe. Nevertheless, the control of emission from diesel engines is expected to be stricter in Europe and North America. In Japan, Tokyo and nearby prefectures (Saitama, Chiba, and Kanagawa) will intro-

duce ordinances controlling diesel engines to run within a specified area enforced in October 2003. We are determined to establish mass production technology while carrying out various checks including assessment of durability, etc.

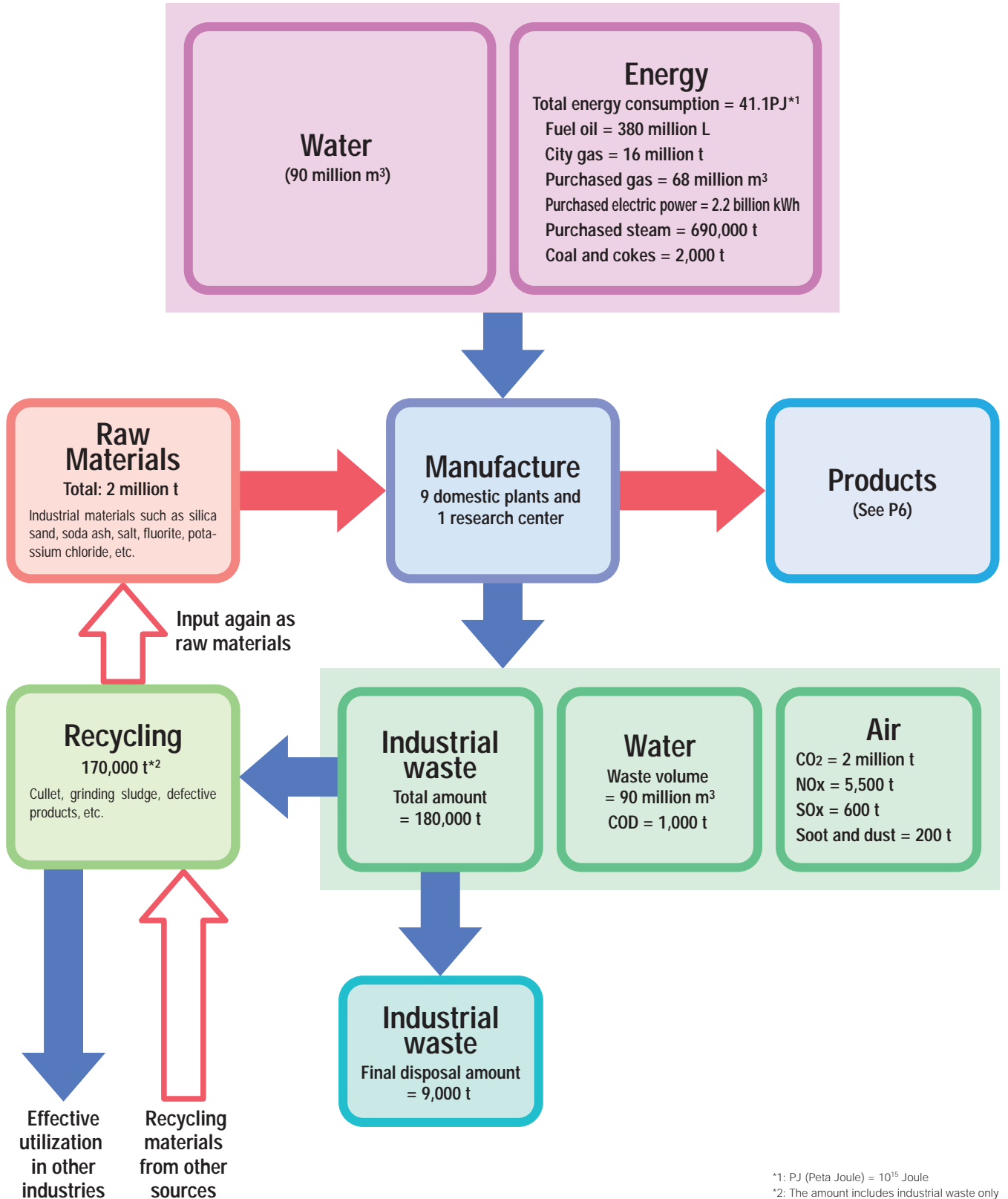


Diesel particulate filter with about 40 holes in a space of 1 cm², with the cylinder diameter being 144 mm.



Material Flow of Products and Environmental Burdens

Our process from use of resources to their disposal is introduced below.
Most of the industrial waste is recycled.

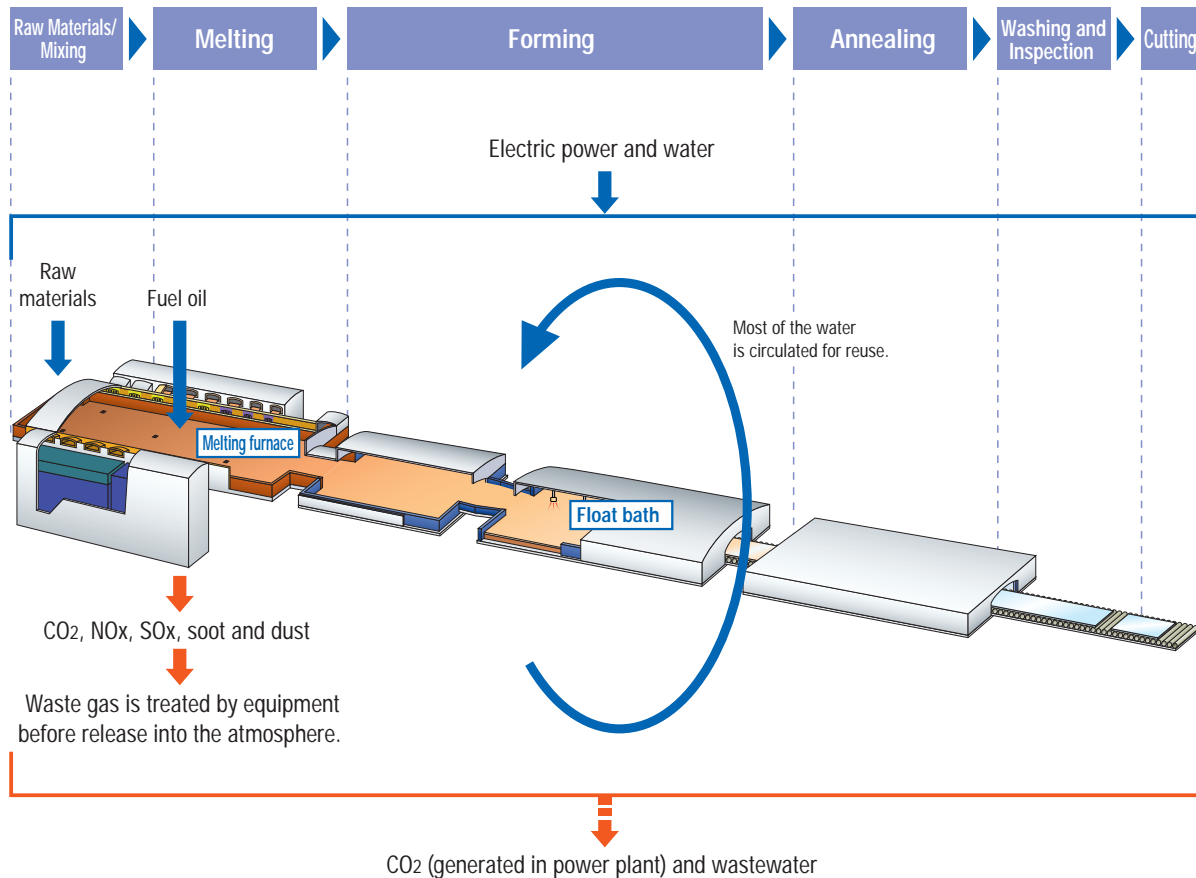


*1: PJ (Peta Joule) = 10¹⁵ Joule
*2: The amount includes industrial waste only



Example of Environmental Burdens in Manufacturing Process

Flat Glass Manufacturing Process



Electricity: Consumed for temperature control in forming and annealing processes, and for operation of machines and conveyors in each process.

Water: Consumed for cooling devices and washing in each process, with most of the cooling water circulated for reuse.

Description

Raw Materials/Mixing

Soda ash, silica sand, and feldspar are major raw materials for glass. These materials and recycled cullet are appropriately mixed according to the type of glass.

Melting

The melting furnace is kept at about 1,600 by burning fuel oil. Glass materials are thoroughly melted here. NO_x, SO_x, soot and dust in the waste gas are purified in waste gas treatment equipment before being released into the atmosphere.

Forming

Defoamed molten glass is smoothly and uniformly flowed over liquid tin to produce flat glass. This is called "float process." The float process can be used to make continuous flat glass with a maximum width of approximately 4 meters.

Annealing

Since sharp temperature change causes distortion to appear in formed glass, temperature control is carried out to cool glass slowly. This is called annealing. Electricity is used for temperature control.

Washing and Inspection

Annealed glass is washed by water and dried. Water used for washing is purified before being discharged. After washing, various inspections are carried out.

Cutting

Glass is cut according to shipment sizes. Both ends of cut glass are recycled as raw material.



Environmental Management System

AGC Group aims at a consistent environmental management system involving not only research center and plants, but also distribution and sales divisions.



Activities for Integration of Environmental Management System

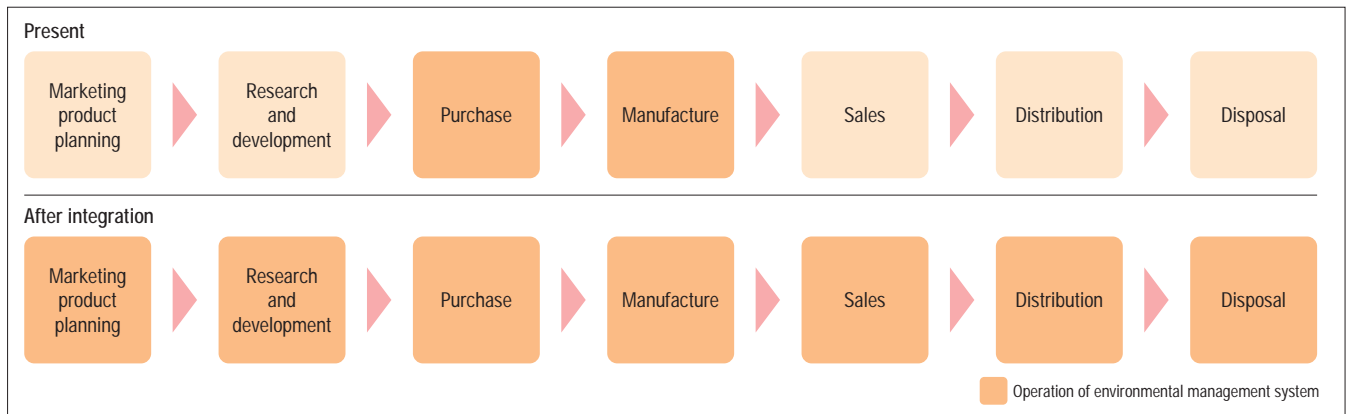
To promote environmental activities, to set up environmental policies and objectives, and to accomplish these policies and objectives are collectively called "environmental management." Job mechanisms such as systems or procedures to implement the aforesaid activities are called the "environmental management system." AGC Group started introduction of international standards for environmental management system, ISO14001, in February 1997. In our company, all establishments were certified by April 2002. 11 of AGC Group companies both in Japan and abroad, acquired certification in 2002, bringing the total number of companies to

acquire certification as of the end of July 2003 to 30 (consolidated subsidiaries). So far, the acquisition of ISO 14001 certification is implemented individually in AGC Group. AGC Group is planning to establish an "integrated environmental management system" that comprehensively includes all business activities including distribution and sales, with management in headquarters as the top. Preparation has already started in Asahi Glass (unconsolidated), with integration scheduled for 2004. The next step is planned to be expanded in the other AGC Group companies both in Japan and abroad.

ISO14001 certification of AGC Group in 2002

Name of company	Place	Establishment
AC Component Co.,Ltd.	Aichi	
AM Component Co.,Ltd.	Kanagawa	
P.T. Asahimas Flat Glass, Tbk	Indonesia	Cikampek Plant
Glaverbel Nederland B.A.	Netherlands	Tiel Plant
Glaverbel Czech A.S.	Czecho slovakia	Teplice Plant
		Retence Plant
		Barevka Plant
		Kryry Plant
		Glavetron Plant
AP Tenntech Corp.	USA	

Integration of Environmental Management System



Execution of Environmental Audit for Qualitative Improvement in Environmental Activities

AGC Group has conducted a comprehensive environmental audit by the Group Corporate since 1994, giving importance to the qualitative improvement of environmental activities. In addition to an annual documentary audit, an on-the-spot audit started in 1996. The General Manager of the Corporate Environment & Safety Directorate visits several establishments each year to determine the actual situation and to make

improvements. Further, environmental audits of affiliates in Japan and abroad started since 2001 by the Group Corporate. The Chemicals Company started an environmental audit of affiliates in 1995, and is making efforts to promote qualitative improvement in overall environmental activities. Other companies have also started them in 2002.

Environmental audit implemented on overseas AGC Group in 2002

Audited company	Place
Asahi Glass Fluoropolymers UK Ltd.	United Kingdom
P.T. Video Display Glass Indonesia	Indonesia
Zibo Asahi Glass Fused Materials Co., Ltd.	China
Zibo Asahi Glass Alumina Materials Co., Ltd.	China



Audit of Video Display Glass Indonesia

Organizations for Environmental Management

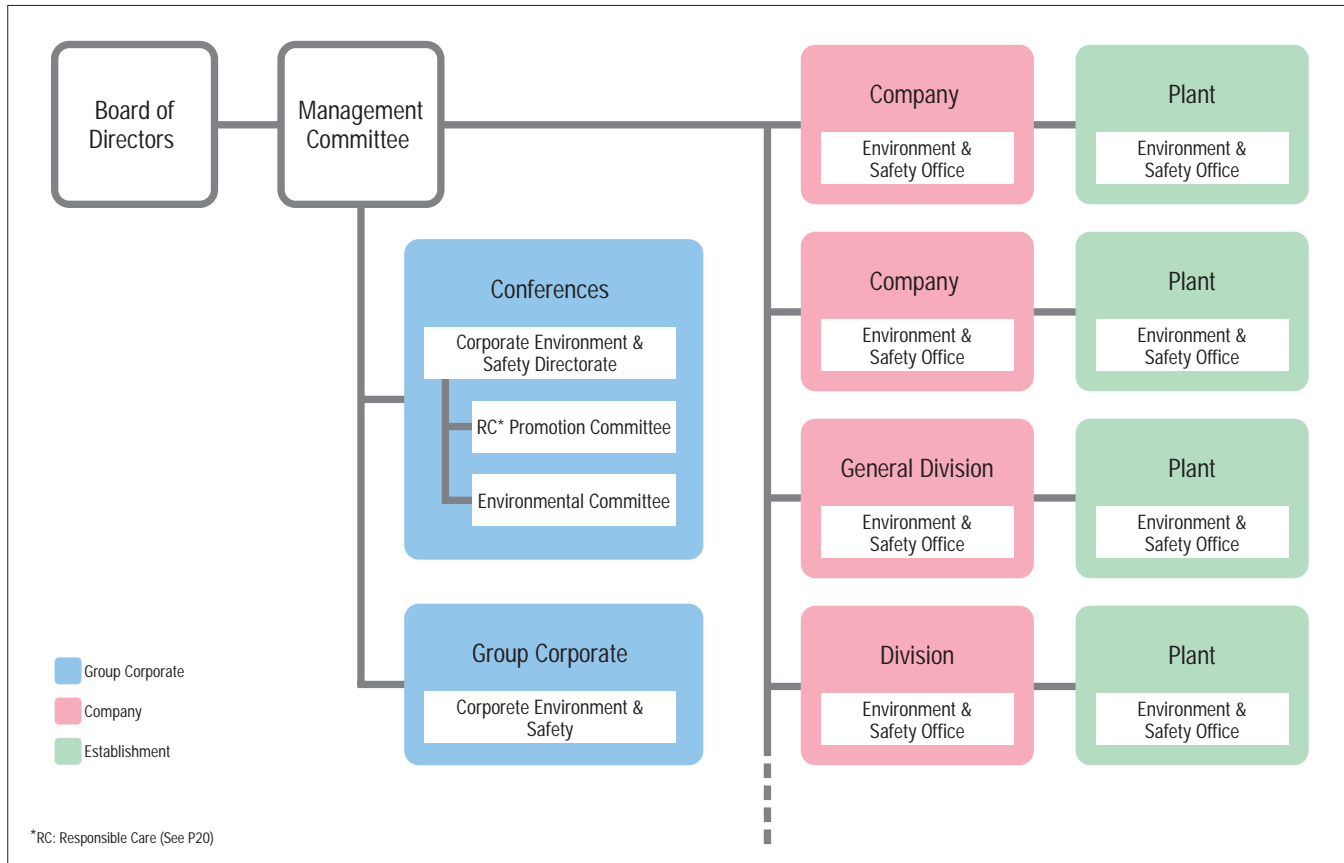
AGC Group has an comprehensive system to promote environmental activities by setting up improvement objectives fitting the levels and business characteristics of the organization.

Promotion of Environmental Activities Using Three-Step Organization

AGC Group introduced the In-house Company System in April 2002, with the Environmental Management organized in a three-step system: "Group Corporate," "Company," and "Establishment."

The Group Corporate sets the "AGC Group Environment & Safety Management Plan" annually. Each Company sets environmental action plan fitting the characteristics of each business. Each Establishment carry out environmental

activities on the basis of the objectives set while paying due attention to environmental problems specific to the region.



Group Corporate

In Group Corporate, Corporate Environment & Safety Directorate sets basic policies and strategies for AGC Group's environmental activities. Corporate Environment & Safety Directorate drafts the precise environmental action plan for AGC Group's. Further, Corporate Environment & Safety follows up on progress in environmental activities of Companies and major affiliates.

The Environmental Committee sets up AGC Group's precise activities and objectives for waste, greenhouse gasses, etc., and controls these activities.

Company

In the corporate environmental action plan, Environment & Safety Office of each Company that take charge of various business fields drafts and promotes optimized environmental action plan according to business characteristics. Follow-up of progress in environmental activities in the establishment or AGC Group companies is also one of its important responsibility.

Establishment

In the establishments (research center and plants) the Environment & Safety Office adds topics and policies specific to the establishment in the Company's environmental action plan, and carries out environmental activities, taking into consideration the community, since each establishment is an important communicator between local residents and AGC Group.



Environmental Accounting

Environmental Accounting discloses the environmental conservation activities of enterprises in terms of accounting data, making provision for investors, customers, and local residents to make a quantitative evaluation of these activities. We intend to make effective use of this data in future environmentally aware management.

We believe that accurately determining management resources spent in a specific environmental conservation activity and the effect thereof is indispensable to promoting effective environmental conservation activities.

Referring to the "Environmental Accounting Guidebook" published by the Environment Agency in 2000, Asahi Glass collected and analyzed environmental accounting data of the Kashima Plant as a model establishment for

introduction of environmental accounting, and disclosed this data for the first time in 2001. Since last year, we have begun to collect, analyze, and disclose environmental accounting data from the Research Center and each plant.

In the present report, the results of analysis of environmental accounting data from the Research Center and each plant are disclosed as in the report last year. This year, we totalized data according to "Asahi Glass Environmental

Accounting Manual." Further, we referred to "Environmental Accounting Guidelines 2002" and "Handbook for Classification of Environmental Conservation Cost 2003" published by the Environment Ministry of Japan.

On the way to development as Asahi Glass in the field of environmental accounting, we are determined to endeavor in this regard for use in environmentally aware management.

Environmental Conservation Cost

Environmental conservation cost is the sum total of the amount used in activities for preventing or limiting environmental impact, for eliminating its effect on the environment, and for restoring disrupted environment.

The amount invested as environmental conservation cost showed a decrease in 2002 because

of the installation of the exhaust gas desulfurizer in 2001 at the Keihin Plant, with the amount of expenses on the contrary showing an increase because of the operation of CFC elimination equipment at the Chiba Plant. Furthermore, the cost incurred by upstream and downstream processes increased because of the increase in

the recovery of cullet from outside from other sources.

Costs corresponding to environmental remediation, the expenditure on countermeasures against soil contamination increased from 2001. With the aforesaid changes, the total amount showed little change.

Notes: Scope of data collected: Data collected is for Asahi Glass, no data was collected from affiliates. Cost outside the plant site is also included*1.
Period of environmental accounting: April 1, 2002, to March 31, 2003 [2002], April 1, 2001, to March 31, 2002 [2001].

Environmental Conservation Cost

Unit : Million yen

Category	2002			2001			Key activities	
	Investment	Cost	Total	Investment	Cost	Total		
Business area cost	3,721	7,287	11,007	5,923	6,163	12,086		
Breakdown	Pollution prevention cost	2,584	4,628	7,212	3,436	4,008	7,444	<Investment> Measures to control air pollution, water pollution, soil contamination, etc. < C o s t > Operation, maintenance, and administration expenses, depreciations, etc. (air, water, etc.)
	Global environmental conservation cost	1,009	1,038	2,047	1,999	531	2,530	<Investment> Measures to save energy, reduce emission of greenhouse gasses, etc. < C o s t > Operation, maintenance, and administration expenses, expenditures on treatment of greenhouse gasses, etc.
	Resource circulation cost	127	1,621	1,748	489	1,625	2,114	<Investment> Measures to reduce industrial waste, recycle resources, etc. < C o s t > Operation, maintenance, and administration expenses, expenditures to reduce emission of greenhouse gasses, etc.
Upstream / downstream cost	0	1,276	1,276	0	566	566	<Investment> Expenditures on recycling of pallets, packing materials, etc. and recovery of glass cullet, etc.	
Administration cost	0	592	592	5	616	621	<Investment> Personnel expenses for environmental management activities, expenditures on maintenance of ISO14001 certification, etc., expenditures on environmental measurements, etc.	
R & D cost	796	3,554	4,350	966	2,999	3,965	<Investment> Development of technologies for energy saving, curbing global warming, etc. < C o s t > Development of recycling technology, energy-saving technology etc.	
Social activity cost	0	111	111	0	132	132	< C o s t > Development and maintenance of green space	
Environmental remediation cost	1,824	1,738	3,562	1,980	915	2,895	<Investment> Anti pollution cost, etc. < C o s t > Levies on air pollution, etc.	
Total	6,341	14,557	20,898	6,894	13,371	20,265	Depreciations (2002/ ¥ 2,222 million, 2001/ ¥ 1,219 million) included in the total cost The figures for 2001 have been corrected from figures of last year according to*1.	



Environmental Conservation Benefit

Environmental conservation benefit are summed up after measuring activities for reducing environmental impact such as for preventing or limiting environmental impact, for eliminating its effect on the environment, or for restoration of disrupted environment in real terms.

For environmental conservation benefit for 2002, the total input of energy remains on the same level, with all other environmental burdens indicating a decrease from the previous year. This shows that environmental impact has been reduced.

We further calculated the rate of reduction after correction based on sales reflecting the change in sales during the 2001-2002 period, with consideration paid to the change in environmental burdens depending on the operation rate of Asahi Glass's plants. As a result, we were successful in reducing all environmental burdens, except for the total input of energy, from the previous year, thus realizing the reduction of environmental impact.

Environmental Conservation Benefit for 2002

		Category	Reduction of environmental burdens ^{*1}	Simple rate of reduction from previous year ^{*2}	Rate of reduction after correction based on sales ^{*3}	
Benefit corresponding to business area cost	Benefit associated with the inputs of resources into business operations	Energy usage	-0.1PJ	-0.2%	-1.6%	
		Water usage	26 million m ³	22%	21%	
	Benefit associated with environmental impact and waste emissions from business operations	Emissions to the air	CO ₂ emission	130,000 t	5.5%	4.2%
			NO _x emission	234t	4.1%	2.8%
			SO _x emission	241t	28%	27%
			Soot and dust emission	13t	6%	5%
		Emission into water bodies	Wastewater	21 million m ³	19%	18%
		COD	169t	13%	12%	
		Waste emission	Final volume of industrial waste disposal	30,000 t	76%	75%
	Benefit corresponding to upstream / downstream cost	Benefit associated with recycling packing materials for product shipment		Reductions are reflected in the following table, "Actual Benefit."		
Recovery of cullet		238,000 t				
Other environmental conservation benefit	Benefit associated with transports and other operations		We have not calculated effects on transportation, etc., associated with business activities			

*1: Reduction of environmental burdens = (Amount of substance in 2001) - (Amount of substance in 2002)

*2: Simple rate of reduction from previous year = Reduction of environmental burdens / (Amount of substance in 2001)

*3: Rate of reduction after correction based on sales = 1 - (1 - simple rate of reduction from previous year) / 0.99
The figure 0.99 indicates the ratio of 2002 sales to previous year's sales at Asahi Glass (nonconsolidated)

Economic Benefit Associated with Environmental Conservation Activities—Actual Benefit—

The economic effects associated with environmental conservation activities reflect the effect of environmental conservation activities the profit of the company in terms of money. There are two types of effect: the effect in real terms with a clear background for the profit and the presumptive effect that indicates profit based on assumed calculation. We collect and analyze data on the effect in real terms.

The increase in energy cost reduction through energy saving for 2002 and the decrease in reduction of waste disposal associated with the saving and recycling of resources are mainly attributed to the reduction in the operation rate of the Funabashi Plant.

Actual Benefit for 2002		Unit : Million yen	2001
Contents of effects			
Revenue	Operating revenue by the recycling of waste generated by key business operations or the recycling of used product	493	605
Expenditure Saving	Energy conservation reduces energy expense	1,400	933
	Resource conservation and recycling reduces waste disposal expenses	1,645	2,042
Total		3,538	3,580



Activities for Reduction of Environmental Burdens

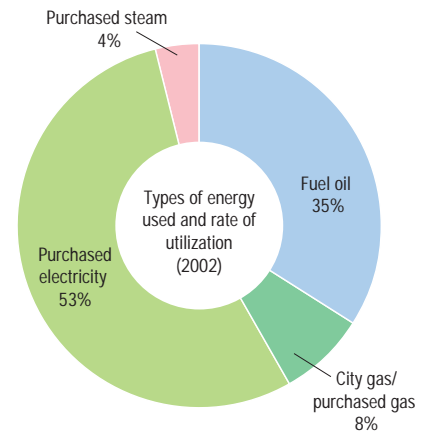
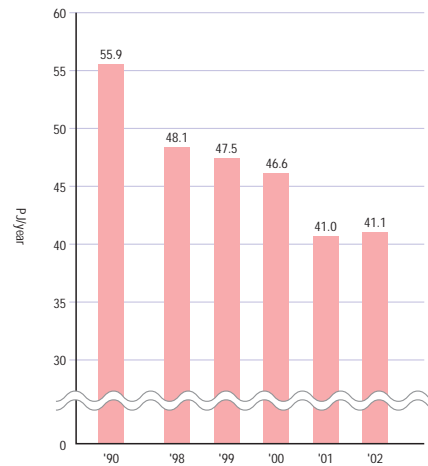
Since Asahi Glass has large-scale manufacturing plants, we are aware of the need to curb the effects on the environment whenever possible. Accordingly, we are making efforts to reduce environmental burdens by adopting various counterplans.

Execution of Energy-Saving Activities in Manufacturing Processes

The manufacture of glass, our main business, consumes a huge amount of electricity and fuel oil. We use many energy sources such as electricity, fuel oil, gas, steam, in a series of manufacturing processes, including high-temperature glass melting furnaces.

We therefore realize our duty to reduce the environmental burdens whenever possible, and take various activities for energy saving and for improving the effective utilization of energy.

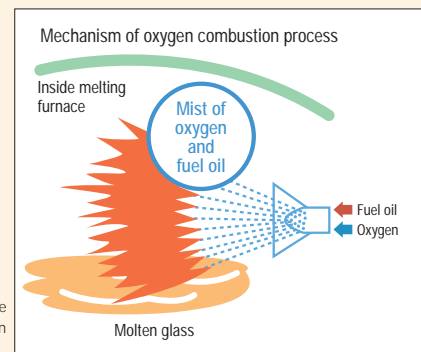
Change in total energy consumption



Example of Energy-Saving Activity—The Oxygen Combustion Process

The glass melting furnace adopts an oxygen combustion process using oxygen instead of air. The new system improves fuel consumption efficiency and reduces the fuel consumption by 20 - 40%. In the glass melting furnace using an oxygen combustion process, fine fuel oil mist and oxygen gas are injected into the furnace through fuel outlets on the left and right to heat the inside of the furnace uniformly. Unlike air that contains a high percentage of nitrogen not involved in consumption,

the oxygen consumption process limits heat loss during consumption, ensuring reduction of NOx by 50 - 80% and SOx by approximately 30%.

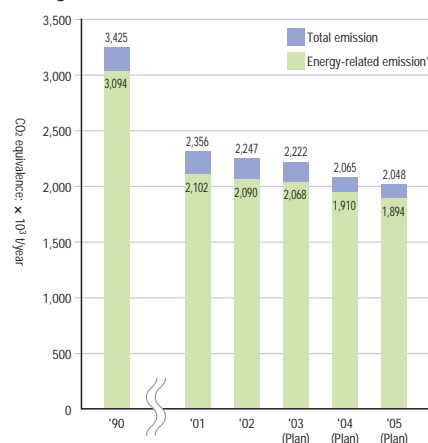


Fuel and oxygen are fed through the nozzle to distribute them evenly in the form of mist inside the furnace.

Reduction of CO₂ Emission through Introduction of New Technology

Asahi Glass is making efforts to reduce emission of CO₂ in order to prevent global warming. Precisely, we are successively expanding adoption of an oxygen consumption process in melting furnaces for flat glass (Keihin Plant) and CRT glass bulbs (Funabashi Plant and Takasago Plant). In addition, we adopted an ion-exchange membrane process (Chiba Plant and Kashima Plant) highly effective for power saving for our salt electrolysis equipment that manufactures caustic soda. Each plant has made efforts in specific ways to reduced CO₂. As a result, we successfully reduced CO₂ emission by 35% from that of 1990.

Change in CO₂ emission



*Energy-related emission refers to the emission of CO₂ caused by consumption of energy. Non-energy-related emission means the emission caused by chemical reactions. As a representative example, soda ash, the raw material for glass, reacts during the manufacturing process to cause CO₂ emission.



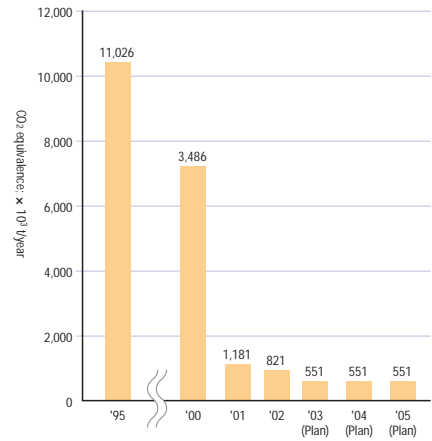
Reduction in Emission of Fluorine-Based Greenhouse Gasses through Strict Control and Technical Development

Out of the 6 greenhouse gasses specified in the Kyoto Protocol* (CO₂, methane, nitrous oxide, HFC, SF₆, and PFC), Asahi Glass manufactures fluorine-based HFC and SF₆, and the company makes utmost efforts to prevent emission or leakage of these gasses into the atmosphere by investing in equipment for countermeasures and strict control. Further, Asahi Glass is also engaged in the development of fluorinated solvent with a

low Global Warming Potential and in the disposal and recycling of CFCs. (See P 21)
The Global Warming Potential is the greenhouse effect of other gasses expressed relatively, with the global warming effect of CO₂ considered as 1. The Global Warming Potential of HFC is 140-11,700 and that of SF₆ is 23,900.

*The Kyoto Protocol specifies the target greenhouse gas reduction to be accomplished by advanced countries within 2008-2012. The agreement was reached at COP3 in Kyoto in 1997.

Change in fluorine-based greenhouse gasses



Consideration for Environmental Preservation in Distribution

Raw materials and glass products are heavy. Hence, Asahi Glass has conventionally been making efforts in saving energy by unloading materials or products at ports nearest to plants, reducing movement of materials inside the plant by compressing stock and using trucks carrying delivery goods for waste collection on return trips.

As a measure to promote this movement, we launched a campaign in 2002 to stop idling of trucks by installing rest rooms for truck drivers. As a result, CO₂ emission reduced by about 78,000 tons.

In order to reduce lumber consumption, the packing material for flat glass products was changed from wooden boxes to steel container. The steel container is a folding type so as to allow repeated use and to be conveniently used for returning things to exporting areas. The shifting to steel container was about completed in 2002, reducing lumber consumption by 4,000 tons a year.



Conventional wooden box



Steel container easy to fold.
The steel material can be repeatedly used and can be folded on return, contributing to energy saving and conservation of resources.



Installation of rest rooms at each plant for truck drivers to prevent idling of trucks arriving early in the morning or waiting for shipments.



Reduction of Air Pollutants by Treatment Equipment and Changing of Manufacturing Methods

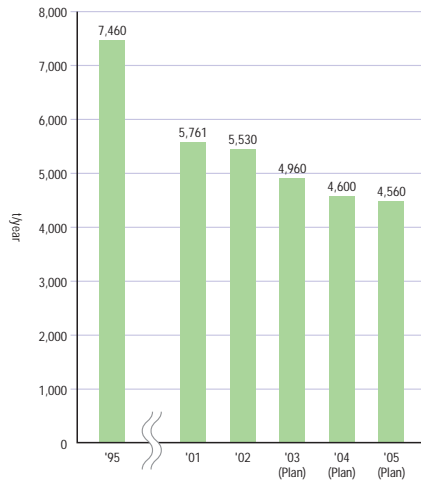
Asahi Glass not only abides strictly by laws and ordinances, but also concludes agreements with regional governments, making efforts to reduce the emission of air pollutants such as NOx (nitrogen oxides), SOx (sulfur oxides), soot, and dust (suspended particulates). We have installed de-

nitration equipment to eliminate NOx and desulfurizer to eliminate SOx, and have introduced in some of our glass melting furnaces an oxygen combustion process that drastically reduces emission of NOx and SOx. In 2002, we had a large-scale repair of our Aichi

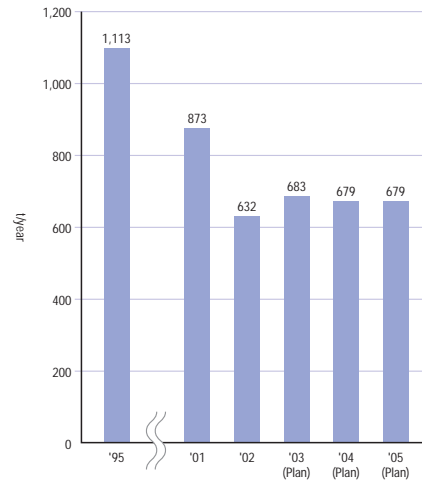
Plant (by cold repair of furnace). This has resulted in reduction of SOx emission since the plant had stopped production for 3 months and a half. However, since the plant will resume its normal operation in 2003, SOx is expected to increase from 2002.

Changes in emission of air pollutants

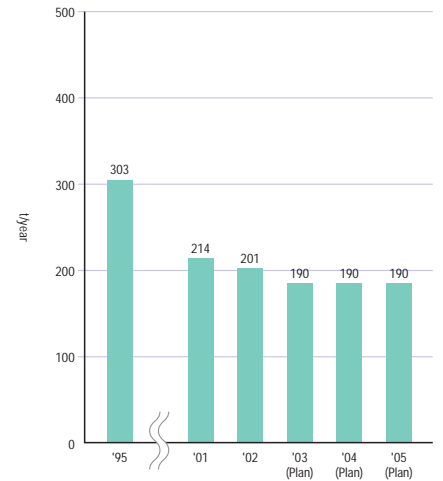
NOx



SOx



Soot and dust



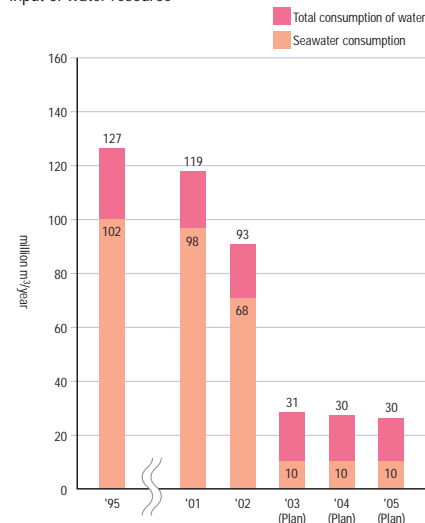
Protection of Water Resources

Asahi Glass uses a large volume of water as raw material, cooling water, and washing water, and we appropriately remove organic and hazardous substances from wastewater before discharging

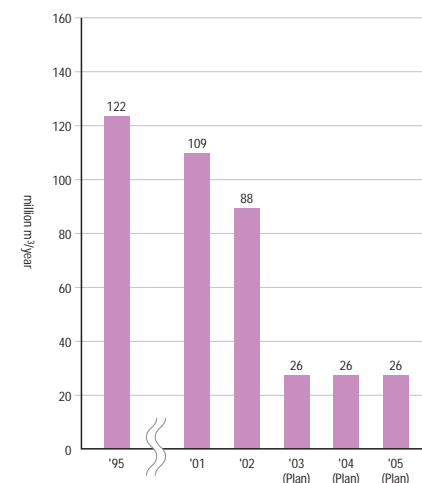
it. With the withdrawal of the Kitakyushu Plant from the chemicals business in 2002 and after 2003, input and drainage of seawater will be drastically reduced.

Water consumption, wastewater and water pollutants

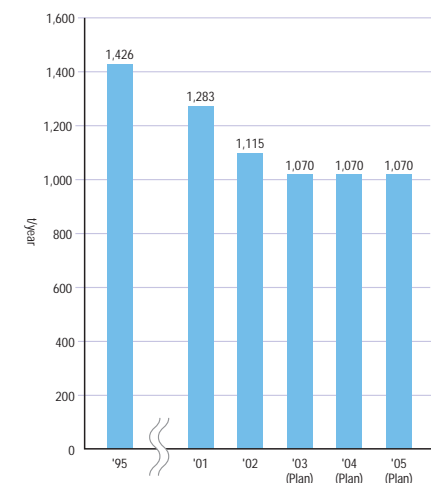
Input of water resource



Total volume of wastewater



COD



*COD: Chemical Oxygen Demand. A measure of the oxygen required to oxidize all compounds, both organic and inorganic, in water.



Soil/Groundwater Examination and Serious Considerations in Decontamination Measures

Asahi Glass voluntarily carries out examination of soil and groundwater contaminations at all its establishments and landed properties that might be contaminated. If contamination is found, we take appropriate decontamination measures

under the direction of administrative authorities and make the relevant information available through the media, including our Home Page.



Confirmation of soil obtained through boring



Inspection of soil boring

Measures to decontaminate soil/groundwater within the grounds of Chiba Plant

Measures in the past

For decontamination measures for soil/groundwater within the grounds of the Chiba Plant of Asahi Glass and Asahi-Penn Chemical Co., an affiliate of Asahi Glass, a Committee to Study Measures was formed in July 2001 by the two companies, administrative authorities (Chiba Prefecture and Ichihara City), and specialists in the field. Since then, we have exclusively discussed the matter and conducted examination and construction works. We will keep administrative authorities informed and communicate with specialists to proceed as they advise. The details of examinations are dis-

closed through our Home Page.

Future Measures

Future decontamination measures are described below.

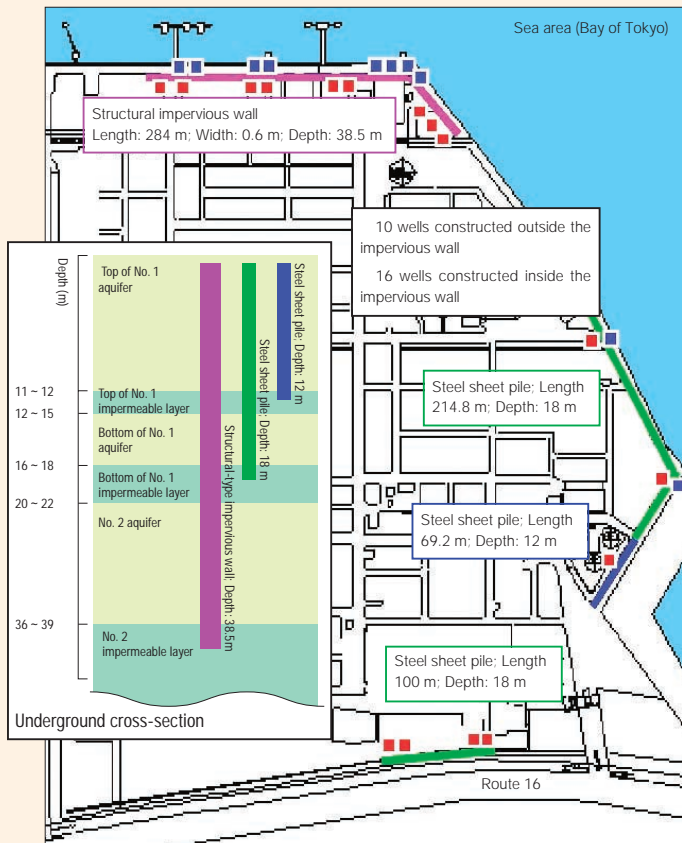
Examination of the contamination mechanism and decontamination measures

On the basis of the basic and working policies approved by the Committee to Study Measures, we will carry out decontamination mainly of dense contamination in the top layer of the No. 1 aquifer, with investigation to be made also on the mecha-

nism of contamination of the No. 3 aquifer. We will take much more effective decontamination measures by studying and adopting new technologies.

Impervious wall installation

Installation of the wall was completed at the end of December 2002, and we continue monitoring groundwater and the concentration of contamination in order to verify the water blocking function.



Top: Range of installation of impervious wall and pumping equipment. Aquifer is the sand layer that filters water easily, where groundwater is normally found. Impermeable layer is a clay layer that does not allow water to pass through easily.
Left: Pumping equipment for contaminated water, with pumped-out groundwater subjected to purification by means of steam distillation.

Details of measures taken after detection of contamination

Year	Details
1994	Asahi Glass and affiliated Asahi-Penn Chemical Co. found that groundwater within grounds of Chiba Plant contained volatile organic compounds, and started pumping out groundwater for decontamination.
1999	The Environmental Agency published "Guidelines for Examinations and Measures against Soil and Groundwater Contamination and their Operation Standards"
March 2000	Under the direction of the Ichihara City Government, a precise investigation was carried out in collaboration with a special investigation organization for one year.
April 2001	It was confirmed through the investigation that soil and groundwater were contaminated with volatile organic compounds beyond reference levels. Both companies reported the contamination to Ichihara City.
May 2001	Both companies and Ichihara City collectively disclosed to the press the results of investigation as well as future decontamination measures, including prevention of proliferation of contaminants using an impervious wall.
July 2001	In order to make a technical study on prevention of contaminant proliferation, a Committee to Study Measures composed of experts, administrative authorities and both companies established, and began exclusive discussions regarding the matter.
December 2001	An interim report was made by the Committee to Study Measures, and disclosed on the Home Page of Asahi Glass.
July 2002	A second interim report was made by the Committee to Study Measures and was disclosed on the Home Page. Taking the points indicated in the report, the construction of an impervious wall was started and completed in December 2002.
March 2003	The 16th Meeting of the Committee to Study Measures summed up its comprehensive report, which was disclosed on the Home Page. We intend to report the state of progress and results of monitoring to experts and administrative authorities as required and to seek their advice in this regard.





Proper Control of Chemical Substances in Compliance with Regulations

Consideration paid to safety using manuals, etc.

The Chemicals Company established the "Regulation for Control of Chemical Substances" in 1992 with the aim to prevent health damage of employees and environmental pollution caused by chemical substances as well as to ensure safety of customers. The regulation has been revised 3 times, and is currently used as the "Manual for Control of Chemical Substances." The manual stipulates the need of approval by the Committee to Study for Commercialization participated in by members from the Environment & Safety Office, Production & Technology General Division, Business Management General Division, and Research & Development Division before commercialization of a chemical substance by the Chemicals Company, paying consideration to the safety of the product.

Further, we joined the Japan Responsible Care Council when it was established, and since then, mainly with the Chemicals Company, have promoted Responsible Care activities. The Council started introduction of a Responsible Care verification* activities in 2002. A verification audit is scheduled for 2003 at the Chiba Plant, mainly in terms of "Occupational Health and Safety" and "Communication with the Community."

Reduction of emissions of substances subject to the PRTR Law

The Pollutant Release and Transfer Resister (PRTR) Law was implemented in 2001, before its enforcement, Asahi Glass joined the pilot project of Japan Chemical Industry Association in 1997, and has since then established a control system for chemical substances.

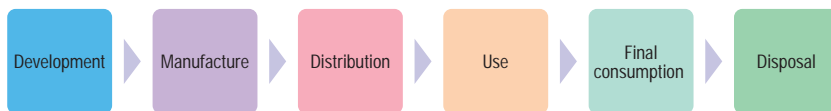
Asahi Glass is making efforts in reducing of emissions of chemical substances subject to the PRTR Law. For instance, we have worked to reinforce incineration equipment for volatile organic compounds, such as dichloromethane, which are widely used as raw materials for chemical products and solvents. As a result, the annual amount of emission for 2002 was reduced by 80% compared to 1995.

We also engaged in regular measurement of the concentration surrounding establishments and in simulated assessment of exposure (calculating influence through simulation in case the chemical substance leaks).

Responsible Care

Definition of Responsible Care

Responsible care refers to activities to be carried out voluntarily by enterprises handling chemical substances through all processes from development to manufacture, distribution, use, final consumption, and disposal to ensure sound environment, safety, and health, to improve social reliability, and to promote communication.



Implementation of responsible care

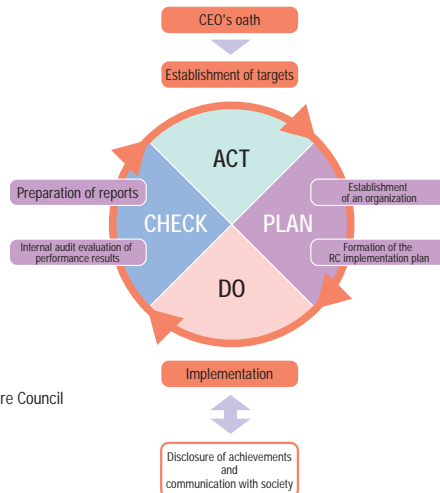
The member enterprises of the Japan Responsible Care Council carry out their activities according to the "Implementation Standards and Guidelines for Responsible Care" prepared by the Council. The activities are carried out according to the PDCA (Plan-Do-Check-Act) cycle. The member enterprises must submit reports on implementation plans and achievements each year to the Council.

Source: A pamphlet, "Do You Know Responsible Care?" published by Japan Responsible Care Council



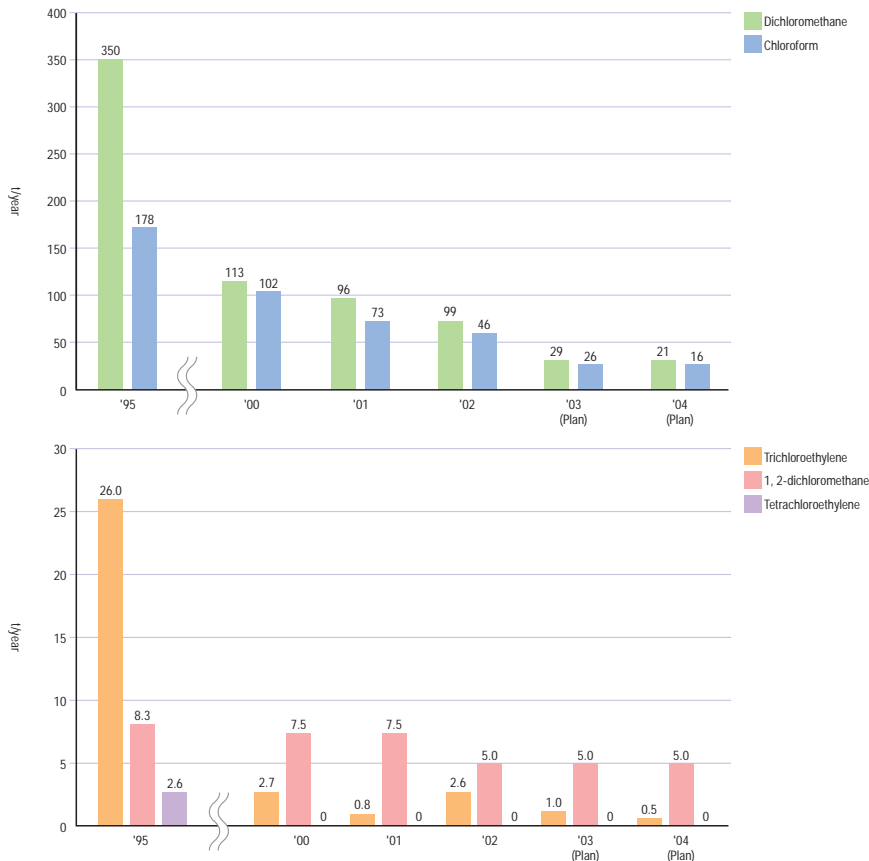
Logotype of Japan Responsible Care Council

PDCA cycle diagram



*Responsible Care verification activities: System to carry out objective assessment of the social responsibilities of enterprises, and the contents and achievements of Responsible Care activities. The system was introduced in 2002 in order to improve the quality of activities and reliability.

Changes in emissions of substances subject to the PRTR Law



Consideration for product safety during distribution, use, and disposal

Asahi Glass pays considerable attention to product safety in taking measures during distribution, use, and disposal of chemical substances.

In the field of distribution, we use Yellow Cards indicating emergency measures to be taken depending on the chemical substance characteristics in case an accident occurs during distribution. These cards are prepared product-wise and type-wise, amounting to 83 types as of March 2003.

In the fields of use and disposal, we have since 1992, been distributing Material Safety Data Sheets (MSDSs) on chemical substances, including the proper method of handling, environmental influence, of each product while the product is in use or when it is disposed of. In order to ensure that the sheet is distributed to each customer, Asahi Glass has established an automatic MSDS issuance system on its LAN. Further, to ensure that the MSDS complies with the JIS (by standardizing items to conform to JIS), the implementation of which is required by the end of

2004, we are determined to complete the job within 2003 and are open results through our Home Page.

Number of MSDS issued (by Chemicals Company)

Japanese language version	Non-Japanese language version
1,271 types	616 types

Promotion of development of future-generation fluorinated solvents

In general, CFC-113 has conventionally been used mainly as a fluorinated solvent. In order to protect the ozone layer, Asahi Glass developed a fluorinated solvent "ASAHIKLIN™ AK-225" as a substitute for CFC-113, and started sales in 1991.

The newly developed solvent has excellent characteristics such as (1) its Ozone Depletion Potential is 1/30 that of CFC-113, (2) it is inflammable, and (3) it has the same detergent capabilities as CFC-113.

With these features highly evaluated, "ASAHI-

KLIN™ AK-225" is widely applied for cleaning precision parts and clothes, and as a solvent, etc. Asahi Glass has conducted research on quality in order to comply with the growing environmental awareness of customers. Consequently, we have succeeded in developing fluorinated solvents with even less Ozone Depletion Potential.

These newly developed fluorinated solvents are products based on HFE (hydrofluoroether) discovered by the Research Institute of Innovative Technology for the Earth (RITE) and HFC (hydrofluorocarbon) discovered independently by Asahi Glass. These feature: (1) Ozone Depletion Potential of zero, (2) a small Greenhouse effect, (3) they are inflammable and (4) they dry easily. We are planning to start offering samples to customers after a safety assessment.

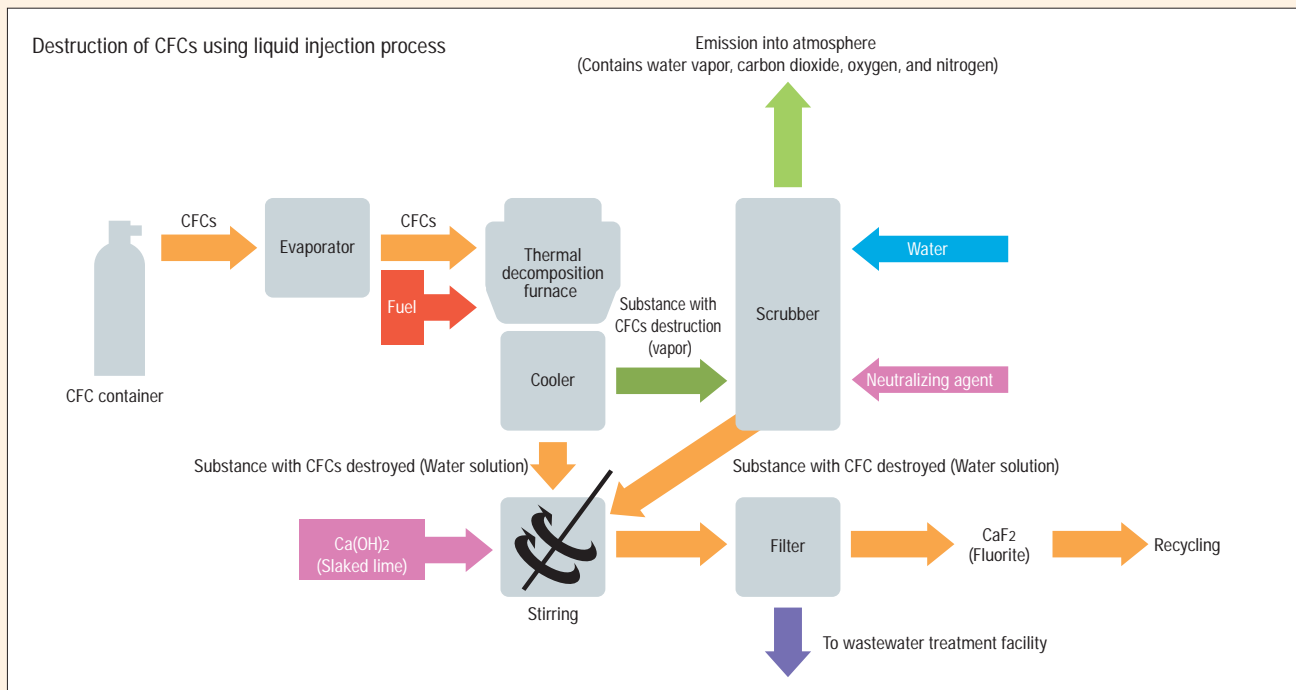


Development of CFC Destruction

In compliance with international circumstances such as agreement on the Montreal Protocol for ozone layer protection, Asahi Glass is working out disposed of CFCs (CFC and HCFC). We started destructing of CFCs collected from customers and then issuing certificates in 1997 at our Chiba Plant. We adopt the technology of liquid

injection authorized by the United Nations Environmental Program (UNEP) for decomposition. The process involves injecting the CFC in liquid or gaseous state together with fuel into the thermal decomposition furnace for thermal decomposition at a high temperature of 1000°C or over. Asahi Glass is further engaged in developing more

advanced technologies such as recycling CFCs into fluorite and then into hydrogen fluoride used as the raw material for fluorinated resin.



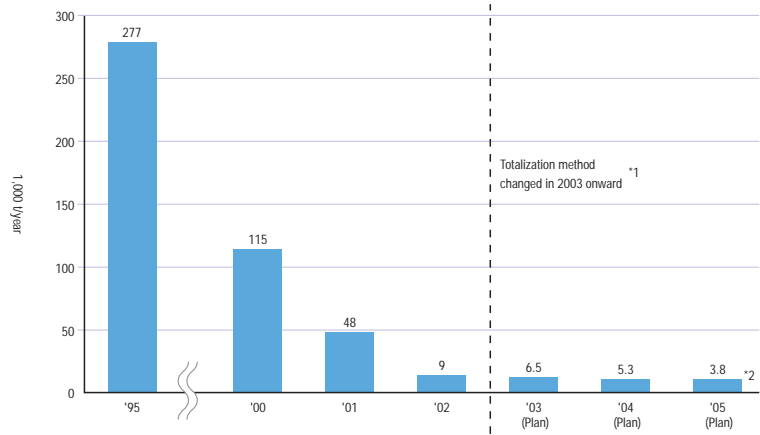
Activities for Realization of Zero Emission of Waste

Asahi Glass aims to accomplish objective collectivity by 2005

In 1995, Asahi Glass set up a high-level target of reducing the final disposal of industrial waste for 2000 by 90% of the actual disposal level of 1995. Although we failed to accomplish the objective in 2000, we could decrease industrial waste to 8% of the 1995 level in the second half of 2001 through recycling of flat glass cullet, abrasive material, abrasive slag of CRT glass, etc.

These activities are controlled by the Environmental Committee, a corporate-wide organization, that checks the progress of activities to reduce industrial waste and decides on related policies and measures. The committee has set up a new objective of "Realization of Zero Emission by 2005" and positively promoted activities to reduce waste.

Change in volume of final disposal



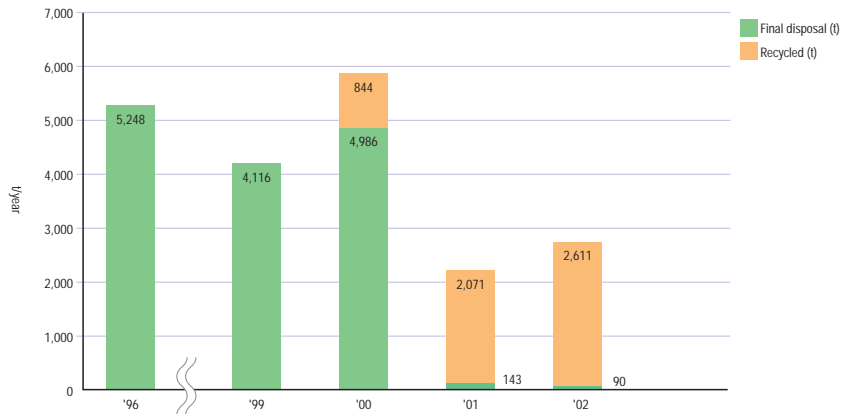
*1: In and after 2003, general waste is included in totalization, with building scrap of plant buildings, etc., counted separately from the aforesaid totalization.

*2: Asahi Glass has set up a target of keeping the (Final industrial waste disposal) / (Total industrial waste generated) to 1% or under. However, we are studying drastic measures, since it is necessary to reduce the planned level by half in order to accomplish the objective in 2005.

Development of technology for recycling slag from glass polishing process

Abrasive slag in the CRT manufacturing process has conventionally been treated as industrial waste at the Takasago Plant. It had long been a major problem since more than 5,000 tons of slag had to be treated annually. In 1999, when the plant acquired ISO 14001 certification, it set about development of technology for recycling slag. In order to make slag suitable for raw material, we started development of a device to remove impurities from slag, and proceeded with the development and improvement of a dryer before establishing effective technology to build up equipment for mass production. As a result, we could attain an abrasive slag recycling rate of 97%, leading to a drastic reduction in the volume of final disposal. We are determined to eventually attain 100% recycling.

Activities to recycle abrasive slag

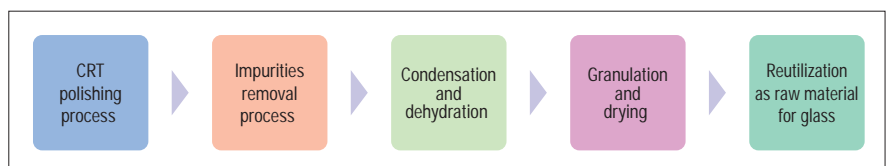


Slag from dehydration process



Slag after drying, turned into raw material for glass

Process flow



Compliance with Laws and Regulations on Recycling

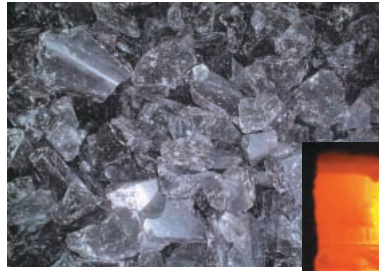
Recycling disposed-of CRT glass

The Home Electric Appliance Recycling Law enforced in April 2001 requires retail traders and local recovery enterprises to collect and recycle electric home appliances (TV sets, refrigerators, etc.) at the consumer's expense. Asahi Glass, a member of the TV Working Team of the Association for Electric Home Appliances from the beginning, has been positively engaged in developing technology for recycling disposed-of CRT glass.

At present at the Takasago Plant and Funabashi Plant, cullet from disposed-of CRT glass is used in the glass melting furnace to recycle as raw material.



Disposed-of CRT glass collected for recycling will be crushed at the intermediate treatment enterprise into cullet form.



Glass in cullet form to be used in the furnace for recycling as raw material for CRT glass.



Recycling of automotive glass

The Vehicle Recycling Law to go into effect at the end of 2004 has no obligatory clause for recycling of glass. Asahi Glass, however, is positively recycling defective products from the plant or recovered items, verifying the recycling technology and recovery.

In order to carry out complete recycling of all automotive glass, there are still various issues to be solved, such as the issue of separation technology. Nevertheless, Asahi Glass is making all-out efforts to start the recycling of all types of glass.

Recycling of laminated glass



Since laminated automotive glass has interlayer film, the film must be removed before recycling.



Crushed cullet when film is removed separated by size.

Recycling of tempered glass



Tempered automotive glass is delivered to the customer in the form shown in the photograph. Used tempered glass is crushed into cullet and recovered for recycling.



When recycling tempered glass, it is necessary to separate cullet into black cullet and transparent cullet using separation equipment.



Green Purchasing to Start Independently from Asahi Glass

In purchasing items for office use, AGC Group is thinking of adding "environment" as a selection criteria in addition to price, quality, function, and design. Provided other factors remain equal, an item with less environmental burdens would be purchased in "green" purchasing. Since 2003, AGC Group has made its own guidelines in this regard, and for the beginning, Asahi Glass will purchase products conforming to the Law on Promoting Green Purchasing when buying items for printed materials, information paper, stationery, office supplies, etc.

In an explanatory meeting at company headquarters attended by about 50 persons in charge of purchasing stationery, "setting up annual targets, implementation of green purchasing through in-house explanation and publicity activities, and working out annual objective after realizing actual achievement" were explained as policy steps. It was unanimously agreed in the meeting to promote positive green purchasing.

Green purchasing objectives for 2003

Items for green purchasing	Green purchasing criteria		Objectives for 2003 (on the base of purchase amount)
Printed paper and information paper	Copier paper	100% recycled paper	80%
		Bleaching no more than: 70%	
	Other paper	Selection of items conforming to the Law on Promoting Green Purchasing	
Copiers, printers, fax machines and personal computers	Selection of items conforming to Green Purchasing Law in the catalog, etc.		100%
Personal computers			100%
Stationery and office supplies			80%
Office furniture (machines) (chairs, desks, storage furnitures, bulletin boards, whiteboards, etc.)			80%

Environmental Chronology

Year*	Asahi Glass	Domestic trend	International Trend
1907	Establishment of Asahi Glass		
1960s-1980s	Installation of electric precipitator and desulphurization equipment for glass melting furnace started Conversion from mercury method to diaphragm method started for manufacture of caustic soda Activities for energy saving	Basic Law for Environmental Pollution Control (1967) Law Concerning the Rational Use of Energy (1979) The Law concerning the Protection of the Ozone Layer (1988)	Polluter-Pays Principle (PPP) Theory of depletion of ozone layer Montreal Protocol (1987)
1992	Research on disposed-of automotive glass recycling started		Rio de Janeiro U.N. Conference on Environment and Development
1993	Environment & Safety Dept. established in General Affairs Division Enforcement of action guidelines for environment	The Basic Environment Law	
1994	AK-225 (HCFC-225; substitute for CFCs) awarded Stratospheric Ozone Protection Awards from USA Environmental Protection Agency		
1995	Participation in Japan Responsible Care Council at establishment		
1996	Drafting an objective for reducing industrial waste "reduction 90% of the FY 1995 level in FY 2000"		ISO 14001 Series published
1997	Fluorocarbon destruction business started at Chiba Plant		Kyoto Protocol
1998	Obtaining of ISO 14001 certification (Keihin Plant) first in Asahi Glass Completion of conversion from diaphragm process to ion-exchange membrane process in the manufacture of caustic soda	Climate Change Policy Law Home Appliance Recycling Law	
1999	Asahi Glass environmental action guideline enforced	PRTR Law	
2000	Environmental Report issuance started	The Basic Law for Establishing a Recycling-based Society Green Purchasing Law	
2001	AGC Group's Environmental Policy implemented Disposed-of CRT glass recycling started	Law concerning the Recovery and Destruction of Fluorocarbons	
2002	Group Vision " Look Beyond " drafted Obtaining of ISO 14001 certification completed by all establishments of Asahi Glass Working out "Corporate-wide objective of zero emission of waste in 2005"	Soil Contamination Countermeasure Law Automotive Recycling Law	U.N. Johannesburg Conference on Environment and Development
2003	Establishment of Corporate Environment & Safety Green purchasing activity started	Disclosure of PRTR data started	

*Year: The year indicates the "calendar year."



Relationship between Asahi Glass and Society



Relationship with Employees

AGC Group distinctly stipulates respect for human rights and safe working environments so that all employees work in safe, cheerful, pleasant conditions.

Activities based on "Look Beyond"

AGC Group Vision "Look Beyond" defines activities of about 50,000 employees worldwide in line with the spirit of "Integrity" and "Diversity" as "Our Shared Values." "Integrity" refers to building open, fair relationships with all of our stakeholders based on the highest ethical standards.

"Diversity" indicates that we will respect individuals with different cultures, capabilities, and personalities, and our global management will operate without regard to nationality, gender, or background.



Our Principles

Innovation & Operational Excellence

To always think with customers' needs as the starting point and act with speed

To never become complacent and to constantly strive for ever higher goals

To continuously seek out innovations in technology, products, services, business models and human resources and to proactively cultivate new fields

To continuously improve our operations toward maximum efficiency and the highest quality in every activity and to achieve excellence in all of the work we do collectively and individually

Diversity

To respect cultural diversity in race, ethnicity, religion, language, nationality, gender and background

To respect individuals and the diversity of their capabilities

To respect different perspectives and opinions

Environment

To respect environmental conservation

To contribute to the development of a sustainable society

To be trusted as a responsible global citizen by the world community

To maintain and improve occupational health and safety and working environments

Integrity

To be confident and proud in fulfilling our responsibilities without compromise

To develop open and fair relationships with every stakeholder

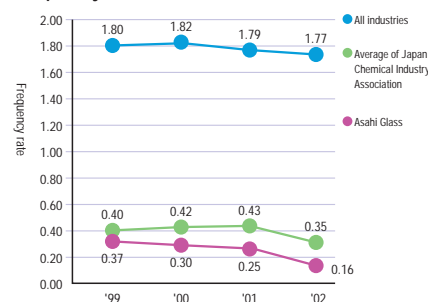
To strictly observe our business conduct code

Top priority given to Occupational Health and Safety of working people

AGC Group's basic policy regarding Occupational Health and Safety calls for their top priority in the workplace. As a part of this policy, an occupational health and safety management system was established and started operation at 2 plants by 2002, in addition to the promotion of management of companies that are consolidated with Asahi Glass. Cooperating companies are also provided with support and guidance to expand facilities for Occupational Health and Safety.

In 2003, All establishments of Asahi Glass will complete building an occupational health and safety management system, while domestic affiliates will start introducing risk assessment within 2003. Support and guidance to cooperating companies are also to be intensified. AGC Group are promoting the two topics as "improvement of the work environment" and "inherent safety of machinery."

Frequency rate of industrial accidents



All employees in all establishments of AGC Group are included in totalization (AGC Group's employees + Employees of cooperating companies)

Frequency rate of industrial accidents
= (Number of employees injured) × 1 million / Total working hours

Awarded Chairman Prize by Japan Industrial Safety and Health Association

At the 61st National Industrial Safety and Health Convention in October 2002, Asahi Glass had the honor of receiving the Chairman Prize from the Japan Industrial Safety and Health Association, which we believe is due to the high evaluation of our long efforts in advanced occupational health and safety management activities.

The following 2 reasons brought us the prize:

(1) "small group activity for safety" started at our Tsurumi Plant in 1961 led to the activity of the Japan Industrial Safety and Health Association, and (2) Asahi Glass contributed to the establishment of a safety engineering specialist system through the activity of presafety diagnosis based on global standards.



Respect for Human Rights

Based on the fundamental concept of respect for humanity, it is necessary for each employee of AGC Group to respect all fundamental human rights. Asahi Glass makes the following two points clear in its stipulation, urging employees to respect each other's human rights:

- (1) Employees and directors shall respect the human rights of other employees and directors. No employee shall be improperly discriminated against or abused on the basis of gender, age, nationality, religion, disability, or background.
- (2) Employees and directors shall not engage in sexual harassment.

Environmental Education for Employees

Asahi Glass provides educational programs in order to widen environmental awareness among employees and the Group members.

One of the main programs, for example, is the AGC Group's Environmental Forum held every year in June in order to promote communication among the Group members about the environment. In the forum, a guest lecturer is invited to deliver a keynote address, or an excellent case of the Group is presented. At environmental seminars, people can learn about updated environmental issues such as control on chemical

substances, soil and the global environment. Other highly specialized environmental education programs are readily available at in-house companies and establishments.

Since it is important to disclose information widely to people living near a plant in order to ensure their a clear understanding, we hold Training in Environmental Risk Communication for persons in charge of local communication at each establishment.



Environmental seminar



Relationship with Society

Asahi Glass is making efforts through various activities to be in harmony with society and to contribute to the prosperity of society as a whole. Some of our activities are introduced below.

Activities for Social Contribution

Given the fundamental concept of contribution to prosperity of society as a whole as corporate citizen, Asahi Glass is making efforts in various activities related to social contribution, in addition to economic activities.

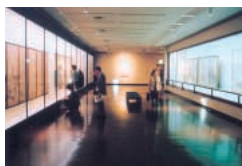
Precisely, we provide donations to various social contribution groups, open our grounds and hold sport events as a contribution to the local

community, and support art activities, mainly backup for glass exhibitions, etc.

Furthermore, we offer information about volunteers through the intranet. Original activities are also carried out in the 4 foundations established by Asahi Glass.



Asahi Glass Cup Aikawa Youth Baseball Tournament



Exhibition of Paintings by Kanō Tan'yū

Records of Social Contribution Activities for 2002

Records of activities in terms of money

¥183.07 million (current profit ratio: 1.66%)

Major regional activities

Asahi Glass Ball Game Meet for Boys and Girls (Chiba Plant)

Asahi Glass Cup Aikawa Youth Baseball Tournament (Sagami Plant)

Plant tours for elementary school students (Aichi Plant)

Major activities for supporting art

Koganezaki Crystal Park
"Technique and Expression 1 – Blown Glass –"

Hokkaido Museum of Modern Art
"Outspoken Glass – Contemporary Glass in Japan –"

The Japan Glass Artcrafts Association
"Glass '02 in Japan"

Tokyo Metropolitan Art Museum
"Paintings by Kanō Tan'yū"





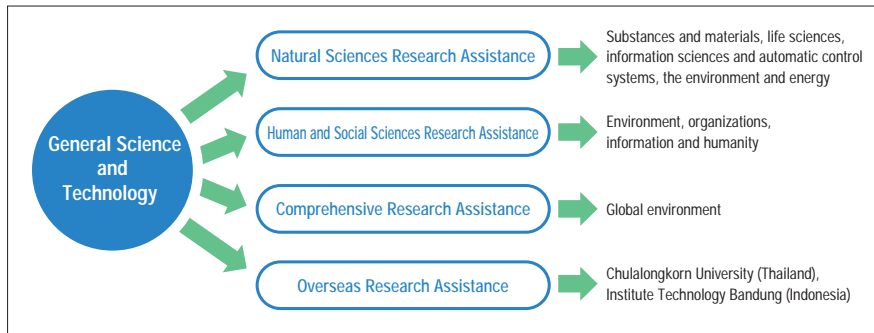
Asahi Glass Foundation

The Asahi Foundation for Chemical Industry Promotion, a foundation established in 1932 in commemoration of the 25th anniversary of the establishment of Asahi Glass Co.,Ltd. for the purpose of contributing to the development of the chemical industry in Japan, is the parent institute of the Asahi Glass Foundation. It was named The Asahi Glass Foundation for Industrial Technology in 1961 and assumed the present name in 1990. The objective of the foundation is contributing to knowledge and the creation of a society that provides mankind with true well-being and prosperity. The foundation is engaged in a wide range of activities, with research assistance and commendation as its two main pillars.

The foundation provides research assistance mainly to researchers belonging to universities in Japan or their research centers and subjects entitled to assistance are related to natural sciences and human and social sciences.

The Blue Planet Prize is a global environmental award given each year since 1992 to 2 individuals or organizations that have made outstanding achievements in scientific research and its applications and, in doing so, have helped provide solutions to various environmental problems. Each winner receives a certificate, a commemorative trophy, and a supplementary award of 50 million yen.

Research Assistance Activities



Asahi Glass Scholarship Foundation

The Asahi Glass Scholarship Foundation was established on the 50th anniversary of the company's founding in 1957 with an objective to foster talented persons. The foundation provides scholarship to talented Japanese and foreign

students in need of economic assistance. The scholarship for foreign students studying abroad started in 1990 as an activity handed down from the Asahi Glass Thailand Foundation and the Asahi Glass Indonesia Foundation.

Overseas Scholarships


Asahi Glass established the Asahi Glass Thailand Foundation and Asahi Glass Indonesia Foundation in commemoration of the 75th anniversary of its founding in 1982 with a view to return profits to

overseas societies. These 2 countries were selected because Asahi Glass has a long history of doing large-scale business there. The foundations are currently providing scholarships for uni-


Awards from the Asahi Glass Foundation

Research Assistance
 Total number of assistance cases for 2002: 162
 Total amounts of assistance: ¥250 million
 Cumulative cases: 5,357, Cumulative amount: ¥6.2 billion

Commendation: Blue Planet Prize
 Recipient for 2002 (11th)




Dr. Harold A. Mooney (USA)
 For indicating quantitative effects of the environment on plant ecosystems, and contribution to its preservation.



Prof. J. Gustave Speth (USA)
 For being the first to scientifically elucidate global environmental problems, and for solving the problems as an internationally important political issue.

Scholarship Payments

Total number of scholarship recipients (2002)
 Japanese students: 92 (¥74 million)
 Foreign students: 11 (¥11 million)
 Cumulative totals
 Japanese students: 3,396 (¥1,619 million)
 Foreign students: 79 (¥139 million)





Glass course at Chulalongkorn University, where Asahi Glass workers work as lecturers

Chulalongkorn University is a well-known national university with a history of more than 80 years, and enrollment of about 26,000 students. It has been 14 years as of 2003 since the glass course started in this university.

The course is a regular credit course for 3rd grade students of the Science and Materials Department, and students learn about glass manufacturing and relevant technologies. The course is held 2 hours a week and lasts for 6 months in the second sem-

ter of the year, with lectures given in turns by Asahi Glass engineers dispatched to subsidiaries Thai Asahi Glass Public Co., Ltd., Thailand Safety Glass Co., Ltd., and Siam Asahi Technoglass Co., Ltd.

It is not easy to give lectures in English for 2 hours, but the engineers get invaluable experience and a good opportunity to make nonbusiness contacts with society.

Activities at Research Center, Plants, and Major Affiliates in Japan

Asahi Glass Co., Ltd

- ★ Head Office
- ① Research Center P30
- ② Kashima Plant P31
- ③ Chiba Plant P32
- ④ Funabashi Plant P33
- ⑤ Keihin Plant P34
- ⑥ Sagami Plant P35
- ⑦ Aichi Plant P36
- ⑧ Kansai Plant P37
- ⑨ Takasago Plant P38
- ⑩ Kitakyushu Plant P39

Asahi Fiber Glass Co., Ltd. P40

- ⑪ Head Office
- ⑫ Ibaraki Plant
- ⑬ Shonan Plant
- ⑭ Kyushu Plant

Asahi Techno Glass Corporation P41

- ⑮ Head Office & Nakayama Plant
- ⑯ Shizuoka Plant

Asahi Glass Ceramics Co., Ltd. P42

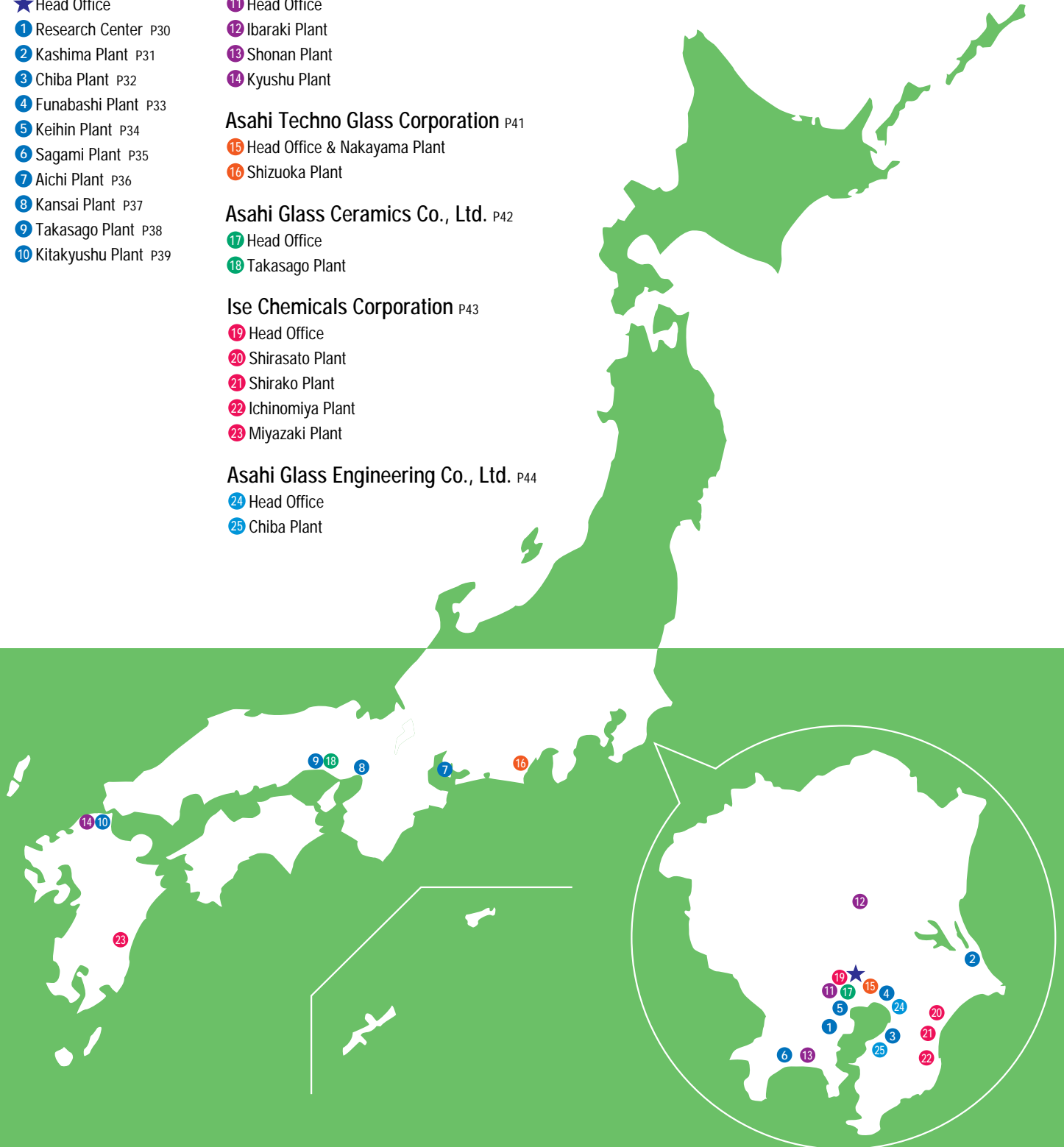
- ⑰ Head Office
- ⑱ Takasago Plant

Ise Chemicals Corporation P43

- ⑲ Head Office
- ⑳ Shirasato Plant
- ㉑ Shirako Plant
- ㉒ Ichinomiya Plant
- ㉓ Miyazaki Plant

Asahi Glass Engineering Co., Ltd. P44

- ㉔ Head Office
- ㉕ Chiba Plant



Research Center

1150 Hazawa-cho, Kanagawa-ku, Yokohama, Kanagawa 221-8755
Tel: +81-45-374-8888
Fax: +81-45-374-8850

Principal research activities

Displays, optics and telecommunications, next-generation production technologies, electronics materials and devices, and energy and environment

Acquisition of ISO 14001 certification

In June 2000

Environmental Policy

Under the basic principle of "Contribution to Global Environment Conservation and Human Happiness through Research and Development of Activities in Glass, Chemical Science, and Electronics." the Research Center abides strictly by laws and regulations, and is engaged in activities such as enforcement of self-standards, proper control of substances in use, environmental impact assessment developed products and technologies and resource saving (waste reduction, paper and energy).

Main Environmental Activities for 2002

The Research Center carries out research and development activities based on the environmental management system with full awareness that the development of products with consideration paid to environmental conservation is "the positive environmental aspect."

The Center commenced the thorough separation and recycling of waste in November 2002, with waste currently separated into 40 types according to

The Research Center established in 1965 is currently engaged in making research for creating new enterprises in such growing fields as telecommunications, electronics, energy, and the environment under the basic policy of "Practical Research and Development to Give Impact to Management."



New building of Research Center completed in May 2003

the new "Industrial Wastes Separation Standard Table," and containers divided into 10 types. As a result, papers that were conventionally incinerated have now come to be recycled into toilet paper. Plastic is also recycled. The Center is determined to keep on with efforts in reducing waste.

TOPICS

Voluntary cleanup of surroundings

One member of the Research Center, who became concerned about the waste surrounding the Center started calling for volunteers to cleanup, and about 35 people joined, collecting waste equivalent to one full light truck. We are going to call upon our employees to be positive in taking the opportunity voluntarily instead of waiting for "someone else to do it."

Excellent achievements in the Women's Self-Defense Fire Brigade Fire-Fighting Skill Contest

Since the Research Center treats numerous kinds of chemicals, we must be constantly on watch for security's sake. The Research Center therefore makes efforts at ordinary times to improve fire-fighting skill. In the Self-Defense Fire Brigade Fire-Fighting Skill Contest held in Kanagawa-ku, Yokohama, in June 2003, the Research Center team won the Women's Indoor Hydrant Handling Sector. They got the 1st and the 3rd prizes in the Fire Extinguisher Sector.



Light truck filled with waste ranging from empty cans to bicycles.



Victorious



Kashima Plant

25 Touwada, Kamisu-machi, Kashima-gun, Ibaraki 314-0195
Tel: +81-299-96-2215
Fax: +81-299-96-7970

Main products

Caustic soda, sodium bicarbonate, propylene oxide, fluoropolymers, heat-reflecting glass, mirrors, double-glazed pairglass, tempered glass, laminated glass, fire-resistant exterior sidings board, etc.

Acquisition of ISO 14001 certification

October 1999

Environmental Policy

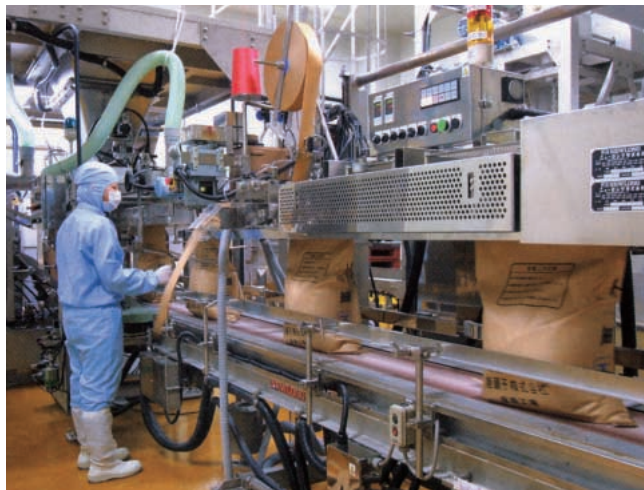
Under the slogan of "Protection of the Globe for the Next Generation," we make efforts for saving resources and energy, for improving productivity, and for promoting recycling, ensuring environmental conservation as far as possible regarding the chemical substances we treat and the products we manufacture.

Main Environmental Activities for 2002

In the activity of Environment management program, we strived for energy saving and for reducing industrial waste and release of gasses (green house gasses and PRTR-related substances) into the atmosphere. As a result, we could reduce energy consumption by 6.3% from the 1997 level and reduce the emission of PRTR-related substances by 56%, almost accomplishing our targets.

Asahi Glass carried out Japan's first partial repair of a glass melting furnace

The Kashima Plant was built in the Kashima coastal industrial region in 1975. As the latest and most sophisticated plant of Asahi Glass, it produces inorganic and organic materials, fluorine-based fine chemicals, flat glass for building with various functions such as burglar-proofing, thermal insulation, and heat reflection, fire-resistant exterior sidings for residences outer wall materials for housing, etc.



Sodium bicarbonate manufacturing equipment is capable of manufacturing high-quality sodium bicarbonate as for medical use. The caustic soda used as raw material is manufactured by the ion-exchange membrane process electrolytic equipment at the Kashima Plant with top-class energy efficiency in Japan, while carbon dioxide, another raw material, is also manufactured and refined making use of the by-product of other processes.

without cooling. Repair ensures longer life of refractories and reduction of waste. In addition, this eliminated the need of heating and trial manufacturing reoperation, contributing to the reduction of CO₂. With the heat exchanger, energy saving was 2.5% up from the previous year. We are determined to keep on positively reducing environmental burdens.

TOPICS

Execution of partial repair of glass melting furnace without cooling

Since furnace refractories are constantly in contact with molten glass with temperature of approximately 1,600°C, repair work with the furnace operating involves risk. Conventionally, the furnace had to be completely cooled before repair, and refractories generally had to be renewed in "cold repair."

However, with long experience of using the furnace, the Kashima Plant amassed the know-how and technology for repair of refractories with the fire burning in the furnace. We could carry out repair safely and successfully using the aforesaid technology, ensuring longer life of the furnace, recuperation of heat exchanger.

Acquisition of certification for inspector of acknowledged security of high-pressure gas and finishing inspection

The acknowledgement system for high-pressure gas allows the enterprise to carry out, on behalf of the administrative authority, security inspection, and finishing inspection on its own responsibility if the self-security system of the enterprise is recognized to have cleared a certain level specified by law. We have recently been successful in acquiring certification for 8 facilities of chemicals division and also for boiler and Class-1 high-pressure vessels.

These certifications are certain to ensure effective maintenance of equipment and continuous steady operation in addition to upgraded operating efficiency of equipment, contributing to saving energy and resources.



Fluorocarbon resin facility, one of the facilities recognized resistered high-pressure gas



Chiba Plant

10 Goikaigan, Ichihara, Chiba 290-8566
Tel: +81-436-23-3121
Fax: +81-436-23-3167

Main products

Chemical products such as caustic soda, caustic potassium, chloromethane, fluorocarbons, fluoropolymers, etc., and surface protection films for LCDs and plasma displays, and destruction of CFCs

Acquisition of ISO 14001 certification

In February 2002

Environmental Policy

In order to reduce the environmental burdens, we are promoting establish an environmental management system, make continual improvements on the system, strive to prevent environmental pollution, and secure symbiosis with the local community and the Earth. As a precise objective, we are promoting to strive for

- promotion of energy saving
- reduction of industrial waste
- reduction of greenhouse gasses

Main Environmental Activities for 2002

Promotion of energy saving

Suppressing the energy prime unit in terms of crude oil equivalent to 0.633 kL/t through heat recovery from water systems and improvement in effective utilization of hydrogen, etc., resulting in a drastic energy saving of approximately 5% up from the preceding year.

Reduction of industrial waste

We have been successful in accomplishing the following targets of industrial waste generation: 17,938 t, recycling rate: approximately 87%, and amount of final disposal of waste: 2,274 t (about 84% less than 1995 level).

The Chiba Plant was built in the coastal industrial region of Ichihara, Chiba, facing the Bay of Tokyo, in 1959. The plant manufactures chemical products using natural gas produced at our Ohami-Shirasato Mining Station and imported raw materials such as raw salt and fluorite, while positively promoting environmental conservation activities.



Hydrochlorofluorocarbon 22 (HCFC-22) recovery and recycling equipment that started operation in 2001. HCFCs are not only subject to regulated production, but their emission control after recovery is also becoming an important and serious issue. Under the slogan of "Protection of Earth and Ozone Layer," we at the Chiba Plant refine HCFC-22 recovered from home air-conditioners and recycled into raw material for fluoropolymers according to the Home Appliance Recycling Law.

Reduction in emission of greenhouse gasses

We have successfully reduced the CO₂ emission rate to approximately 24% of the 1990 level, amounting to 521,060 t. We also reduced emission rates of other greenhouse gasses such as the by-product Hydrofluorocarbon 23 (HFC-23), in terms of CO₂ equivalent by approximately 88% of the 1995 level (amounting to 821 t). We are determined to continue our efforts for reducing environmental burdens.

TOPICS

Offering plant facilities to help local community to learn about environment

About 50 people attending the Kamagaya Civic Seminar visited the Chiba Plant on March 18 to learn about our environmental conservation activities. The Seminar has a regular learning program about environment, and most of the visitors were "highly impressed" with the positive environmental conservation activities at the plant.

As a company holding the chair of "Environment Conservation Association of Chiba Prefecture"

The Asahi Glass Co., Ltd., Chiba Plant, as Chair of the Association, positively promoted environmental conservation activities throughout Chiba Prefecture in collaboration with enterprises and administrative authorities through 2001-2002. At Chiba Conference of Environmental Symposium held in November 2002, the Chiba Plant, as the Chair, announced its opinion for the first time in the plenary session. We are making efforts to get people to understand chemical substances. We have heard from a large number Symposium participants that they have changed their opinions about the availability of chemical substances.



Civic Seminar held in March 2003



Activities at Research Center, Plants, and Major Affiliates in Japan
Chiba Plant

Funabashi Plant

1-10-1 Kitahoncho, Funabashi, Chiba 273-0864
Tel: +81-47-424-1101
Fax: +81-47-425-0760

Main products

CRT glass

Acquisition of ISO 14001 certification

In May 2000

Environmental Policy

Under the slogan of "Each of us has responsibility to leave a rich environment to future generations," we are promoting activities for saving resources and energy and for reducing and recycling waste.

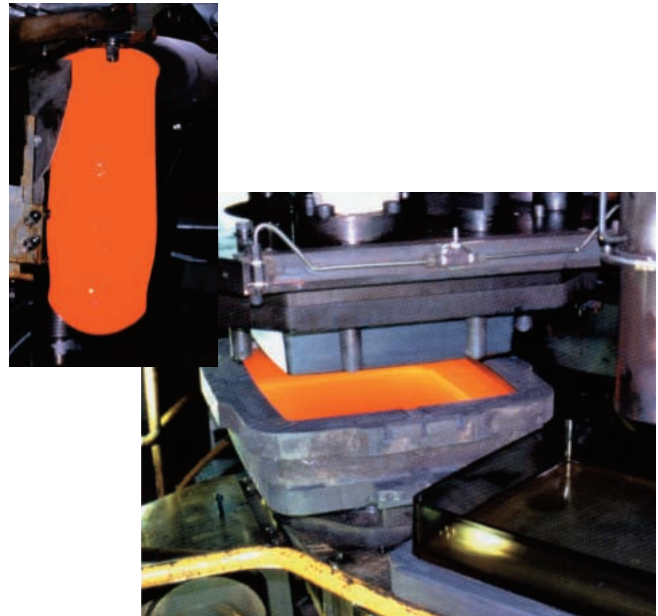
Main Environmental Activities for 2002

The plant is recycling glass cullet collected from disposed-of TV sets and personal computers into raw material. Further, as the chair-holding enterprise of the Association of Business Enterprises for Keeping the Ebi River Clean, we have been positively striving for water conservation as a part of our activities for preserving the neighboring environment. We are continuing the "cleanup of the surroundings program" conducted and participated in by employees once a month.

In the partial dismantling work that has already started in compliance with the scheduled closure of the plant by the end of 2003, we are paying due consideration to neighborhoods regarding dust, drainage, noise, and other issues. For ISO 14001, we recertificated in May 2003 to make it clear that Asahi Glass carries through the attitude of placing much importance on the environment.



Situated east of Shin-Funabashi Station on the Tobu-Noda Line, the Funabashi Plant was established as an exclusive plant for manufacturing cathode-ray tubes (CRT) glass and started operation in 1956. As Asahi Glass plans to move the production base overseas, the production operations of the plant will stop by the end of 2003.



Top: Glass melted at 1600°C is cooled to 1,000°C before being fed into the molding machine.
Bottom: Glass is subjected to pressure molding by using a metallic mold.

TOPICS

Participation in "Cleanup of the Ebi River" campaign

The Association of Business Enterprises for Keeping the Ebi River Clean was established in 1972, and has since then continued activities for keeping the river clean. Members of the Association are companies situated in the basin, including the Asahi Glass Co., Ltd., Funabashi Plant, the chair-holding company, Asahi Techno Glass Corporation, and others.

The main activities are participation in the Environment Fair held in June, "Cleanup Funabashi City Day" held in November, etc. The general meeting of the Association of Business Enterprises for Keeping the Ebi River Clean (photograph) is held once a year.



General meeting of the Association of Business Enterprises for Keeping the Ebi River Clean



Keihin Plant

1-1 Suehiro-cho, Tsurumi-ku, Yokohama, Kanagawa 230-0045
 Tel: +81-45-503-7100
 Fax: +81-45-503-9635

Main products

Glass substrates for liquid crystal display (LCD), plasma display panel (PDP)

Acquisition of ISO 14001 certification

In February 1998

Environmental Policy

Under the slogan of "Protect the Green Earth Yourself," the plant is promoting continual activities for reducing environmental burdens through all aspects of plant management. Precisely, we are continuously reducing NOx, SOx, waste, etc., and energy sources such as heavy oil, electricity, and city gas.

Main Environmental Activities for 2002

The plant was the first in Japan for manufacturing flat glass to introduce the oxygen combustion process in melting furnaces. The process is quite effective for energy saving and preventing air pollution. With operating conditions optimized, the melting furnace ensured reduction rates shown below compared the conventional "air combustion process."

Heavy oil: Approximately 30%

CO₂: Approximately 13%

NOx: Approximately 50%

SOx: Approximately 30%

We are working to reduce energy consumption, particularly electricity consumption, in 2003.

The Keihin Plant started operation in 1916 in Tsurumi, the center of the Keihin coastal industrial region. The plant currently manufactures glass for multimedia in addition to flat glass for construction and extra-thin flat glass for LCDs by making effective use of up-to-date sophisticated technology.



A net is clipped between two heated sheets of flat glass to produce the wire glass for construction. The melting temperature reaches 1500°C or over, but glass here is kept under 900°C.



[Activities at Research Center, Plants, and Major Affiliates in Japan]
Keihin Plant

TOPICS

Certification of OHSAS 18001 for the first time in glass industry

The Keihin Plant is the only plant in the flat glass industry to acquire internationally acknowledged certifications: ISO 9001 in the field of quality control, ISO 14001 in the field of environment, and OHSAS 18001 in the field of occupational health and safety. Of the three certifications, OHSAS 18001 acquired in April 2000 was the first to be received by an enterprise in the glass industry.

OHSAS 18001 is an international standard for Occupational Health and Safety Management System with the secretariat based in the U.K., and it aims at reducing the risk of occupational health and safety in a plant and to ensure a comfortable and safe working environment for employees.

Under the close examination of the degree of danger, we divided risk into 4 classes (A-D), and built the system by improving step by step, starting with significant risks.

After acquiring OHSAS 18001 certification, we closely looked into a total of 12,127 cases of risk involved in occupational health and safety at our plant by March 2003. We have already reduced the risk of 1,203 cases of 1,253 cases of significant risk. Risk can be reduced through careful improvements in the working environment including equipment investment by organizing a proper system and indicating precise objectives. We are determined to keep our working environment comfortable and safe.

Occupational Health and Safety Management



Sagami Plant

426-1 Sumida, Aikawa-machi, Aiko-gun, Kanagawa 243-0301
Tel: +81-46-286-1254
Fax: +81-46-286-1688

Main products

Automotive safety glass

Acquisition of ISO 14001 certification

In August 1998

Environmental Policy

With the continual improvement of environmental burdens as the pillar of management, the plant makes efforts in all fields of plant management for continual reduction of environmental burdens. For instance, main environmental activities include reduction and recycling of waste, reduction in energy consumption, reduction in public water consumption, effective utilization of paper, and proper control and reduction of chemical substances.

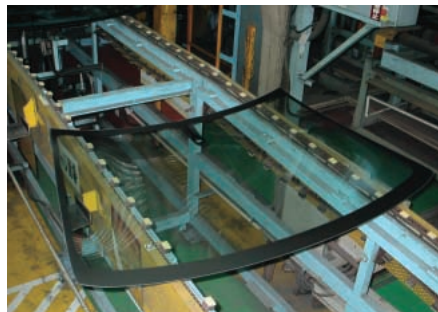
Main Environmental Activities for 2002

Reduction of stock rate to 2/3 of the conventional level helped realize the effective use of warehouses and packaging containers. The "job change" (mold change) frequency, however, increased by 2 to 3 times, which prevented reaching the planned level of energy saving. At present, we are making efforts to reduce the time for "job changes" to half, and are gradually making good progress.

For waste, we are promoting separation of noncombustibles and recycling of subbase course materials, with the reduction rate for 2002 being 93% of the 1995 level. We are targeting zero emission for 2005.

For chemical substances, we have replaced ethylene glycol used in the grinding process with a substance not included in the PRTR Law control subject, and made efforts to eliminate lead oxide contained in ceramic printing. As a result of the efforts, about 80% of our products have been lead-free.

The Sagami Plant started operation in 1972 as a general manufacturing plant for automotive safety glass, which is supplied to automobile makers in the Kanto area. The plant site includes the Technology Development Department and Engineering Center, which cooperate with the Manufacturing Department in carrying out business activities.



Manufacturing process for automotive glass, with glass fabricated to specified shape. The black portion indicates the section with baked ceramic.



Autoclave (pressure device), a cylinder facility with a large hemispheric door. Two sheets of fabricated glass with film laminated are put inside the autoclave for bonding under high pressure. The autoclave is 4 m in diameter.



[Activities at Research Center, Plants, and Major Affiliates in Japan]
Sagami Plant

TOPICS

Promotion of communication with local communities

We invited ward chiefs from 10 neighboring wards for a visit to our plant on September 11, 2002. The Plant General Manager showed participants the laminated glass and tempered glass processes; they also observed the falling ball test and listened earnestly to the explanation and description of the General Manager.

We also handed them documents containing environmental policies of the plant and Asahi Glass Environmental Report. We also had an opportunity to explain the activities of the plant for environmental conservation, to answer their questions, and to hear their impression.

The Sagami Plant has conventionally been keeping communication people in the neighboring community, for example, by regularly holding the "Asahi-Cup Aikawa Youth Baseball Tournament." However, there were some ward chiefs who visited the actual manufacturing process in the plant for the first time and were amazed to see how spacious and automated the establishment was.



Plant visitors



Aichi Plant

1 Aza Asahi, Taketoyo-cho, Chita-gun, Aichi 470-2394
 Tel: +81-569-73-1110
 Fax: +81-569-72-4890

Main products

Flat glass, various-colored flat glass, and automotive safety glass

Acquisition of ISO 14001 certification

In March 2000

Environmental Policy

Under the slogan of "Let's All Take a Leading Role in Protecting Our Earth", the plant is engaged in reduction of environmental burdens, the conservation of the natural waterside environment, effective use of the natural resources, development of products with less environmental burden, improvements including replacement with less harmful substances, and manufacture of products.

Main Environmental Activities for 2002

Energy Saving

In the Automotive Glass Department, we were successful in reducing energy consumption in terms of crude oil equivalent by 6%. In the Flat Glass Department, melting furnace operation of 1 line was stopped for 3.5 months for cold repair (a repair process where the fire in the furnace is put out and refractories are replaced). From December to February after cold repair, thermal efficiency showed improvement, contributing to reduction in energy consumption by 2% over that before cold repair. We are determined to keep striving for energy saving in 2003 and after.

Industrial Waste

We could reduce industrial waste by 93% against the target of 90% reduction from the 1995 level. From now on, we are promoting activities for zero emission of industrial waste by 2005.

The Aichi Plant started in 1970 to manufacture flat glass, the material for laminated glass and tempered glass to be delivered to automobile makers. At present, the plant also manufactures automotive glass with high added-value such as water-repellent, transparent, and conductive glass.



The manufacture of automotive glass is almost completely automated. However, human eyes are still more reliable in inspecting for defects such as scratches.

Installation of Sound Barrier

We have installed sound barrier as a soundproof measure at the cooling section of the tempering furnace newly installed in the manufacturing process of tempered glass for automobiles. As a result, the noise at the plant boundary was reduced from 79 dB to 69 dB.



Activities at Research Center, Plants, and Major Affiliates in Japan
Aichi Plant

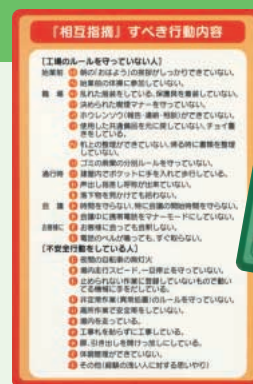
TOPICS

Special Considerate Card for preventing accidents at work

The Special Considerate Card is a card to prevent errors or accidents during construction or at work. The card has 25 items of caution on the back, and is delivered to a person who violates the caution item. The card thus circulates through the plant. This card is more effective than oral warnings, and it helps establish harmony inside the plant.

Annual plant tour offered to local elementary, junior high, and senior high school students

The Aichi Plant invites students from local elementary, junior high, and senior high schools once every year on a plant tour. Since there are a large number of high-temperature facilities inside the plant, many people are involved in taking care of these students during tours, but we are continuing this program as part of communication with the local community. Among visiting students, some are children of employees of the plant, which helps strengthen family ties.



Three years have passed since the card system started. Items numbered 10 at the beginning and have now increased to 25 items, reflecting opinions from field workers.



The plant tour is made up of a small group, so plant personnel remain sufficiently attentive.

Kansai Plant

2 Nishimukoujima-cho, Amagasaki, Hyogo 660-0857
 Tel: +81-6-6413-3325
 Fax: +81-6-6417-5129

Main products

Glass substrate for liquid crystal display and plasma display panel

Acquisition of ISO 14001 certification

In December 2000

Environmental Policy

The Kansai Plant plans and inspects by paying due attention to new laws and regulations regarding the environment and revisions to promote "continual reduction of environmental burdens." The plant works to provide environmental educational programs for employees to make each aware of the importance of environmental improvement.

Main Environmental Activities for 2002

In advance of corporate-wide activities, the Kansai Plant has positively carried on its environmental activities targeting "zero emission of industrial waste by the end of 2003", with the amount of final disposal for 2002 being 17 t against the target of 30 t. Compared to the reference value of 4,735 t in 1995, the industrial waste was reduced to 0.4% by the end of 2002, which is attributed to sludge being successfully recycled into raw material and the drastic reduction of general waste. General waste was reduced from 2.1 kg per person per month in April 2002 to 0.6 kg per person per month in March 2003 as a result of employees making terms per workshop to compete in reducing the waste. The number of employee is to increase in 2003, but we are determined to continue activities to reduce final disposal of waste.



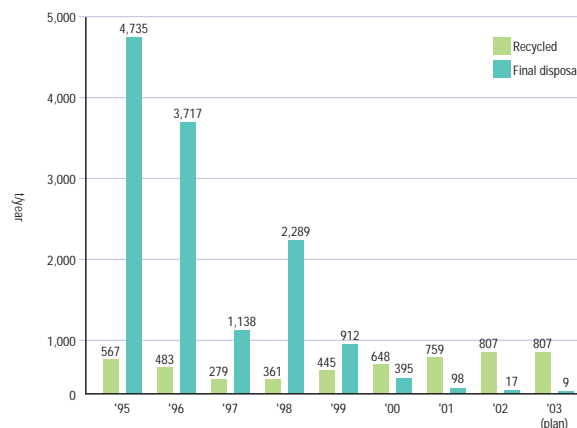
Easy-to-understand Waste Separation Manual at field level

The Kansai Plant started operation in Amgasaki, center of the Hanshin industrial area, in 1907 simultaneously with the establishment of Asahi Glass. The plant was the first successful in Japan in mass production of flat glass. At present, the plant manufacturers specialty glass for various display devices using advanced and sophisticated technologies.



View of final inspection of glass substrate for plasma display panels. Bubbles with diameters as small as 0.1 mm and minute scars are carefully screened out.

Final disposal volume and recycled amount of waste



TOPICS

KR21 Campaign promoting vitalization of plant and promotion of recycling

The Kansai Plant launched the KR21 Campaign in April 2002, with KR standing for Kansai Renaissance. In this campaign, all employees including managers are divided into small groups in order to look into points of issue in the workshop and to raise awareness. Points indicated by each group are taken up from the standpoint of cost, and the viewpoint of actual problems faced by the person in charge, and appropriate measures are taken. Such activities have been proved successful and effective, for example, work could be done smoothly in the clean room by putting things in order, finding the cause of material leakage from the material feeder, and taking appropriate measures to drastically reduce leakage.



Poster for promoting KR21 Campaign



Takasago Plant

5-6-1 Umei, Takasago, Hyogo 676-8655
Tel: +81-794-47-7304
Fax: +81-794-48-6631

Main products

CRT glass, high-purity silicon carbide, ceramics, and fine ceramics

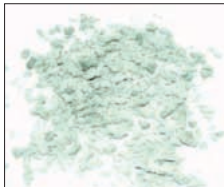
Acquisition of ISO 14001 certification

In May 1999

Environmental Policy

With full awareness of the fact that the manufacture of glass bulbs and materials for semiconductor production equipment and ceramic products involves comparatively high environmental burden, the Takasago Plant positively promotes preventing air and water pollution for saving resources and energy, reducing and recycling waste in order to reduce environmental burdens.

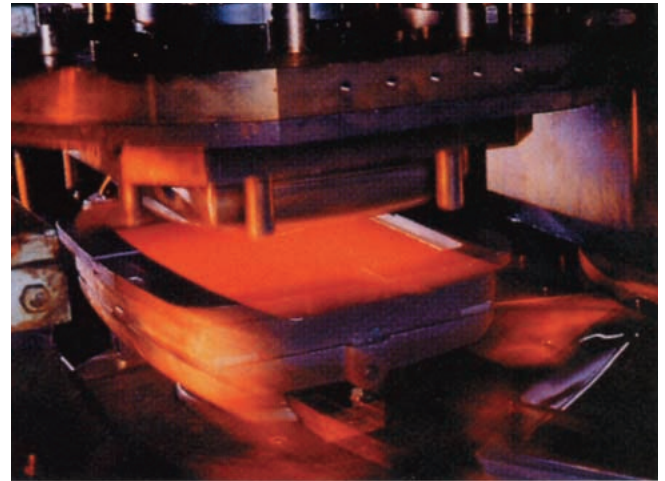
Main Environmental Activities for 2002



We have successfully attained our targets in 16 items including the improvement in the measurement of soot and dust from the glass melting furnace among the 23 improvement items set as objectives in the Plant Environmental Improvement Promotion Plan for 2002.

We reduce of industrial waste by 92% from the 1995 level. The plant's role of recycling slag from the polishing process, the major waste, was raised to 97% against 93% of 2001. We are also taking positive steps toward recycling of disposed-of CRT glass cullet as part of the measures for complying with the Home Appliance Recycling Law. We made up a team for promoting energy saving in November 2002 in order to reduce CO₂ emission, and are driving for accomplishing the target by the end of 2003.

The Takasago Plant, established in the coastal district of Takasago, Hyogo Prefecture, in 1939, currently manufactures cathode-ray tubes (CRTs) glass. The plant is responsible for dispatching new technologies to AGC Group's subsidiaries overseas in order to cope with the trend of TV screens becoming larger and flatter.



Manufacturing process of CRT glass. The products are fabricated by pressing with high-precision metallic molds in order to prevent inclusion of bubble or deformation, before being subjected to surface treatment in an automatic polishing machine. The products are further put to washing and finally to finishing.

TOPICS

Promotion of beautification and tree planting inside the plant

The Takasago Plant has recently been engaged in promoting beautification and tree planting inside the plant, providing various flowers and trees, through all seasons of the year. Last year, we planted trees on a part of the old Ceramics Bonding Facilities (about 15,000 m² in area).



Green area in the plant where tree planting was promoted

Excellent hazardous substances handling place and manager

In accident prevention, the plant holds an annual hydrant operating contest and fire drill participated in by its employees. In 2003, Takasago City awarded prizes for excellent hazardous substances handling place and manager. In order to upgrade occupational health and safety, we set up the Occupational Health and Safety Management System based on OHSAS 18001 in 2003.



Execution of regular fire drill

Kitakyushu Plant

5-1-1 Makiyama, Tobata-ku, Kitakyushu, Fukuoka 804-8520
Tel: +81-93-871-1551
Fax: +81-93-871-2842

Main products

Automotive safety glass

Acquisition of ISO 14001 certification

In April 2002

Environmental Policy

The Kitakyushu Plant is changing production from "high energy consumption" to "low energy consumption," and has continuously promoted activities for zero emission of waste. We have also been making efforts in environmental conservation in Makiyama and Edamitsu area as a member of the community.

Main Environmental Activities for 2002

Concerning energy conservation, we have adopted intermittent operation with intensive production instead of conventional operation with continuous production to achieve high energy efficiency, where a high production rate is maintained during all production. To reduce the emission of industrial waste, we have reduced the consumption of office paper and separated different types of waste paper by original use so that part of this waste can be recycled. As a result, waste was reduced by 65% of the level of the base year 1995. Further, we are promoting reduction in cullet generation by improving the glass substrate yield and the design yield.

The Kitakyushu Plant stopped manufacturing chemicals in autumn 2002, and stopped the operation of the power plant, eliminating the source of air pollutants when the electricity sales contract expired by the end of March 2003. With the use of hazardous substances such as high-pressure gas reduced, the plant is now reviewing the conventional security system and is enforcing a new policy of outsourcing security personnel.

The Kitakyushu Plant, constructed as the second plant of Asahi Glass, started manufacture of flat glass in Japan, and developed production of soda ash first in Japan as a pioneer in the chemical industry. The plant is now a site for manufacturing automotive safety glass with the latest and most sophisticated equipment.



The automated fabrication line equipment for automotive glass, with the operation being monitored collectively in a separate fabrication line monitoring room.



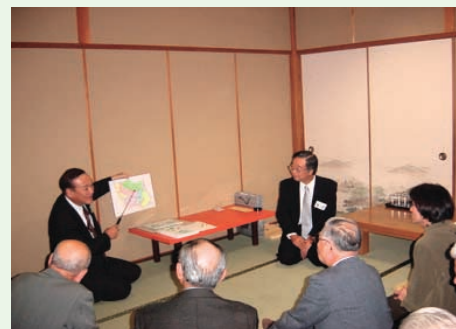
[Activities at Research Center, Plants, and Major Affiliates in Japan]
Kitakyushu Plant

TOPICS

Annual Environmental Monitors Meeting held with the local community

Based on the concept of the plant as a member of the community, the Kitakyushu Plant holds a Regional Environmental Monitors Meeting every autumn, joined by people from neighboring local communities such as Makiyama and Edamitsu area. In this meeting, we explain Asahi Glass business as well as the Environmental Report, and hear from the local residents about their problems (problem related to advanced age, problem of crime prevention, etc.) to keep and promote mutual communication.

Through this meeting, local residents deepen their understanding of our performance and situation, as well as have a sense of trust and closeness. The plant is determined to continue holding such meetings in the future.



Regional Environmental Monitors Meeting

Asahi Fiber Glass Co., Ltd.



3-6-3 Kanda Kaji-cho, Chiyoda-ku, Tokyo 101-0045
Tel: +81-3-5296-2031 Fax: +81-3-5296-2044
Plants: Ibaraki Plant (Ibaraki Prefecture), Shonan Plant (Kanagawa Prefecture), and Kyushu Plant (Fukuoka Prefecture)
URL: <http://www.afgc.co.jp>

Asahi Fiber Glass was established in 1956 as the first comprehensive manufacturer of glass fiber in Japan. The company has since been manufacturing and selling glass wool and long glass fiber.

Principal Business Activities

Glass fiber is produced by fabricating glass melted at high temperature, and is broadly classified into glass wool (wool-like fiber) and glass fiber.

Glass wool

Glass wool is produced by fabricating glass into wool-like form using a manufacturing method similar to that for cotton candy. A bonding agent is added and the glass is processed into flat or cylindrical form with excellent performance in heat retention, heat insulation, sound absorbance, and nonflammability. It is used in various construction materials for houses and buildings. It is also widely used as heat insulation and absorbance material for industrial products such as car bonnets.

Glass fiber

After being melted, glass is drawn through a hole several millimeters in diameter to produce fiber, which is then fabricated into different forms depending on the molding method of ultimate products such as rolled roving, mat-shaped and cut products, making it appropriate for resin reinforcement application. These reinforced plastics (FRP and FRTP) are light in weight and show excellent performance in durability, antierosion resistance, and insulation, so they are widely applied in industrial products such as bathtubs, personal computer parts, automobile parts, etc.

Environmental Conservation Activities

With global conservation a major topic of management, the company considers "Glass Fiber Gentle to the Global Environment" the pillar of its business. The company's Shonan and Kyushu Plants have acquired ISO 14001 certification as exclusive plants for manufacturing glass wool. The Shonan Plant was acknowledged as an "Environmental Management Establishment" based on the ordinances of Kanagawa Prefecture.

The Glass Wool Operation is positively promoting recycling, such as recycling defective products from the manufacturing process and fragments collected from construction sites into raw materials in addition to making efforts to reduce energy for distribution by compressed packaging of products. The Glass Fiber Operation is striving positively for promoting recycling of defective products from the manufacturing process and recycling and reutilization of FRP waste mainly in cooperation with the Japan Reinforced Plastics Society.



1. Manufacture of glass wool and installation of heat insulation material
2. Manufacture of long glass fiber and product roving
3. Cullet from the manufacturing process is automatically discharged outside to be recycled into raw material
4-5. Defective glass wool is made into cullet, with fragments cut and made into other products to minimize production loss.
6-8. Finished insulator is compressed before packaging, contributing to improving distribution efficiency and reducing energy consumption.

TOPICS

Promotion of recycling cullet collected from other sources

About 85% of the raw material of Asahi Fiber Glass glass wool is recycled glass. We recycle glass bottles separated and collected from other sources as well as glass cullet from the plant. After being acknowledged by the Ministry of Welfare of Japan as a "Wide-Area Recycling and Industrial Waste Disposal Enterprise" in

1999, we have started the collection of glass wool waste from construction sites for recycling into raw material. Thanks to our activities, the glass wool insulating material "GLASRON™ WOOL" has been acknowledged as a product with the "ECO MARK" of the Japan Environment Association.



Activities at Research Center, Plants, and Major Affiliates in Japan
Asahi Fiber Glass Co., Ltd.

Asahi Techno Glass Corporation



1-50-1 Gyoda, Funabashi, Chiba 273-0044
Tel: +81-47-421-2121
Fax: +81-47-421-2071
Plants: Nakayama Plant (Chiba Prefecture), Shizuoka Plant (Shizuoka Prefecture)
URL: <http://www.atgc.co.jp>

After being established as the first Western glass plant in Japan in 1883, the company joined AGC Group in 1952, and became merged with Toshiba Glass Corp. in 1999.

Principal Business Activities

With technologies for specialized glass amassed through the period of former Iwaki Glass and Toshiba Glass as basic technology, Asahi Techno Glass supplies an extensive line of products through its Automotive Lighting Products Division, Optical Coating Division, Fluorescent Bulb Division, and Electronic Materials Division. We are shifting business to such growing fields as electronics, optical science, telecommunications, and biotechnology. Some products of these divisions are introduced below.

Automotive Lighting Products Division

This Division produces lighting products for automobiles, such as headlight glass custom-shaped lenses, sealed beam lights and aspheric lenses, halogen light bulbs, reflective light bulbs, and molds.

Optical Coating Division

This Division supplies components for optical products such as CD-ROM. These include multimirror reflectors and lenses, projection mirrors, glass elements for CCDs, and optical pickup devices for DVDs.

Fluorescent Bulb Division

This Division produces glass bulbs and tubes for fluorescent lamps. Our products include specialized glass materials such as glass bulbs and tubes for lighting and soda lime glass.

Electronic Materials Division

This Division supplies glass and ceramic materials used for electronics and industrial applications. Our products include frit glass, low-temperature sintered glass, aluminum nitride substrates, neck tubes, and pressure sensors. Our newly developed products such as potassium niobate are attracting wide attention in the field of advance technology.

Industrial Materials Division

This Division supplies glass materials for various industrial products such as electrical appliances and housing, including glass parts for electronic cooling machines, glass tiles, high index glass beads, reflective sheets, magnetic powder, glass plants, and glass lining pipes.

Sci-Tech Division (Science Products)

This Division manufactures products mainly used in the research fields of medical science, pharmacy, chemistry, and physics, with products including various labware, tissue cultureware bio-related equipment, reagents, thermometers, fluorescent dosimeters, and glass measuring apparatuses for solid-state properties.

Houseware Division

This Division supplies tableware made of heat-resistant glass, cookware, reinforced porcelain, light-forced porcelain, and other utensils needed in everyday life under its traditional "Iwaki" brand.



With optical and electronic devices becoming more and more high-density, large-capacity, and high-performance, glass devices for electronic devices are required to have high-precision processing accuracy. Top-left is the polishing process of glass parts for electronic devices. The clean room for the inspection process is shown at bottom-right.



Environmental Conservation Activities

The Nakayama Plant acquired ISO 14001 certification in July 2001 and the Shizuoka Plant in October 2001. Both plants are working on recycling waste, with the Nakayama Plant attaining a recycling rate of 70% in 2002 and the Shizuoka Plant improving reduction by 46% in 2002 from the previous year. On the basis of these achievements, employees are determined to learn from environmental activities of leading companies and carry out activities for the next PDCA cycle.

TOPICS

Positive promotion of communication with the community

The Nakayama Plant is carrying out activities as a member of the "Association of Business Enterprises for Keeping the Ebi River Clean." Chaired by the Asahi Glass Funabashi Plant. Employees interested in such activities positively participate in different local events such as the Funabashi City Environmental Fair in June, Clean Funabashi City Day in November, Rape Blossoms Fair, Kazusa Digging Project, and Rice-Planting Experience, in order to promote communication with the local community. The "Heat-Resistant Tableware Bazaar" is greatly enjoyed by lovers of glass tableware.



Heat-resistant Tableware Bazaar



[Activities at Research Center, Plants, and Major Affiliates in Japan]
Asahi Techno Glass Corporation

4-1-23 Shiba, Minato-ku, Tokyo 108-0014
Tel: +81-3-5442-9179
Fax: +81-3-5442-9190
Plant: Takasago Plant (Hyogo Prefecture)
URL: <http://www.agcc.jp>

The Ceramics Division of Asahi Glass and Asahi Furnace System Co., Ltd., were merged to establish Asahi Glass Ceramics Co., Ltd., in 2002, and the company inherits the amassed technologies related to refractory manufacturing started in 1916.

Principal Business Activities

Asahi Glass Ceramics contributes broadly and largely to the industrial and public fields through Glass Engineering and Environmental & Energy. The company targets a sustainable society while living in harmony with the environment by offering customers solution-related core technologies through ceramics.

Glass Engineering

This operation has its main customers in glass manufacturing enterprises and enterprises doing business in secondary processing of glass. Our technical assets are the great number of glass manufacturing and fabricating technologies handed down from Asahi Glass Co., Ltd. and ceramics technology that contributes to optimization and longer furnace life. Through comprehensive technologies obtained by combining these 2 technologies, the Glass Engineering supports furnaces required for glass manufacture or glass fabrication in raw materials, analysis, operation support, planning support, design, and construction.

For example, we supply electric fused cast refractories, bonded refractories, etc., in the field of raw materials, technology for simulating the inside of furnaces, which cannot be observed directly, and defects analysis technology in the field of analysis, together with troubleshooting that may occur in a furnace during operation and software for data amassed for 10 years in second unit instantaneously in the field of operation. In planning, we provide suggestion for optimization of investment and productivity at construction of a new furnace or at cold repair. In design and construction, we provide consistent service for safe, prompt, low-cost design and construction of furnaces and plants overall.

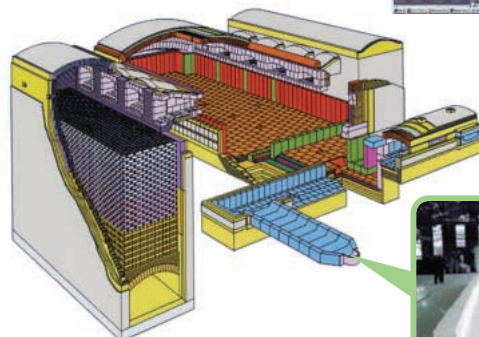
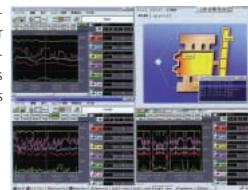
Environmental and Energy

Asahi Glass Ceramics has developed a variety of ceramics applied making the most effective use of refractories and ceramics, etc., and is supplying this equipment to the incinerators of autonomous organizations and to high-temperature electric power, metal, and cement industry treatment facilities. This equipment and related devices include different types of castables (devices to change raw materials furnaces) for fluid-bed incinerators, rotary-kiln incinerators, and melting furnaces, heat exchangers, induction heating and melting systems for heating and solidifying molten slag using electromagnetic induction, etc. Ceramics called zirconium boride (ZrB_2) that makes furnace material for melting furnaces show excellent corrosion resistance and inductivity equivalent to pure iron against molten metal or slag with high resistance against heat exceeding 3,000°C. All of these help reduce environmental burdens involved in high-temperature treatment of substances, contributing to the conservation of the global environment.

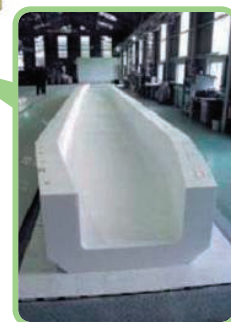
Environmental Conservation Activities

The Takasago Plant of Asahi Glass Ceramics is located at the Takasago Factory of Asahi Glass Co., Ltd., to carry out activities for saving energy and reducing environmental burdens under the Environmental Management System of the Asahi Glass Takasago Plant.

The inside of the melting furnace constantly operating at 1,500°C or over cannot be observed directly, so simulation using sensors and computers is made to control internal conditions of the furnace.



Sectional diagram of glass melting furnace. The section at the front shows the fore hearth hot well, a passage to lower the temperature of molten glass gradually. This passage uses our ceramics with high resistance against heat.



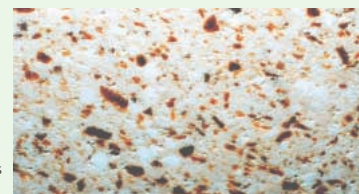
TOPICS

Chrome-free refractories to reduce environmental burdens



BNC series chrome-free refractory

Cross-section of BNC series chrome-free refractory



BNC series chrome-free refractories are furnace material for the burning and tire zones of cement rotary kilns developed by Asahi Glass Ceramics, paying consideration to environmental pollution caused by waste. The cement rotary kiln is a furnace that burns raw material at a high temperature during the cement manufacturing process. The refractories used for the kilns must have high thermal resistance, corrosion resistance, etc. BNC series refractories are chrome-free, and contribute not only to reducing environmental burdens, but also to reducing the disposal cost of used refractories.



Ise Chemicals Corporation



1-13-1 Kyobashi, Chuo-ku, Tokyo 104-0031
Tel: +81-3-3535-0760 Fax: +81-3-3535-0773
Plants: Shirasato Plant, Shirako Plant, Ichinomiya Plant (Chiba Prefecture) and Miyazaki Plant (Miyazaki Prefecture)
URL: <http://www.isechem.co.jp/> (Japanese only)

Ise Chemicals Corporation originated from the Ise Iodine Plant established in Ise, Mie Prefecture, in 1927. It was reorganized as Ise Chemicals Corporation in 1948, and received capital participation by Asahi Glass Co., Ltd., in 1960 to strengthen its management base.

Principal Business Activities

Ise Chemicals Corporation is foremost manufacturer of iodine applied widely in pharmaceuticals, contrast media for X-rays, photosensitizers for photographs, agricultural chemicals, catalysts, etc. In addition, Ise Chemicals manufactures nickel-based and cobalt-based metallic compounds used for batteries and natural gas used as a clean energy source.

Iodine and Iodine Compounds

Japan, renowned as an iodine manufacturing country covering about 40% of world output, exports iodine and iodine compounds to a large number of countries. Ise Chemicals is the top manufacturer in Japan to take in such few natural resources of Japan. Natural iodine is contained in brine, ancient seawater lying some 1,500-2,000 meters deep under ground. Ise Chemicals mass-products high-purity iodine from this brine. "ISEFLO" is a high-quality product processed in spherical form using the unique manufacturing process of Ise Chemicals.

One common iodine-base compound is gargle available at hospitals. Our products of iodine-based compounds, both organic and inorganic, count for more than 50 types, taking only the main products into consideration, with their application ranging widely from electronics-related fields to medical, agricultural, and food fields.

Natural Gas

Natural gas, a by-product of iodine, is an energy source generating less SOx and low environmental burden. Natural gas dissolved in brine is separated when taken out before being sent to households in Chiba Prefecture through a pipeline.

Metallic Compounds

Ise Chemicals manufactures nickel-based and cobalt-based metallic compounds using its unique solvent extraction, reactive crystallization, baking, and other process. These compounds are used as electroplating materials, catalyzers, metallic soap, magnetic materials, etc., and in rechargeable batteries of cell phones and personal computers.

Environmental Conservation Activities

We pay attention to protection of the natural environment and conservation of natural resources, seeking to become an enterprise that can gain understanding from and harmony with society. Ise Chemicals is positively promoting recovery and recycling, particularly of iodine, nickel, cobalt, etc., regarding the environment as an important theme. The main recovery source of iodine is used iodine for catalysis from the manufacturing process of medical and pharmaceutical products and industrial chemicals, while nickel and cobalt are separated and recovered from aircraft engine scrap and heat-resistant alloy using our original solvent extraction.

We are promoting company-wide electricity saving after our Shirasato Plant was a Designated Energy Management Plant in 2000. We organized a Safety and Environmental Audit Team in March 2002 in order to determine, maintain, and improve the present environment and safety. The company carries our promotion of improvement by publishing and distributing its Audit Report.



Cluster of "ISEFLO", spherical iodine with almost uniform size. A single sphere is approximately 2 mm in diameter. The spherical shape provides excellent fluidity, making iodine easy to use.



Example of 50 kg fiber drum of "ISEFLO": About 70% of iodine products are exported in this container to different countries.



Left: Manufacturing line for cobalt compounds used for batteries of personal computers and cell phones
Top: CoO (Cobalt monoxide)
Bottom: Co(OH)₂ (Cobalt hydroxide)

TOPICS

Active services as the Secretariat of Forum on Iodine Utilization

The Forum on Iodine Utilization (FIU) is a research group established in 1998 with the cooperation of Chiba Prefecture, Chiba University, an association of iodine-related enterprises, i.e., industrial, academic and administrative circles, to carry out development and research on applications of iodine. Ise Chemicals is currently the secretariat of the forum.



[Activities at Research Center, Plants, and Major Affiliates in Japan]
Ise Chemicals Corporation

Asahi Glass Engineering Co., Ltd.



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 Tel: +81-43-350-3366
 Fax: +81-43-350-3383
 Plant: Chiba Plant (Chiba Prefecture)
 URL: <http://www.agec.co.jp>

Asahi Glass Engineering Co., Ltd., originated from Keiyo Manufacturing Co., Ltd., established by Asahi Glass as the Plant Engineering Company in 1959. It merged with Asahi Glass Environmental Engineering Co., Ltd., in 1985.



[Activities at Research Center, Plants, and Major Affiliates in Japan]
 Asahi Glass Engineering Co., Ltd.

Principal Business Activities

Asahi Glass Engineering Co., Ltd., provides high-level environmental solution services making effective use of exclusive, sophisticated technologies amassed through achievements in plant construction and maintenance, in addition to carrying out design, manufacture, execution, and control of various equipment for treating waste gas and wastewater, and for preventing soil contamination and removing soil contaminants. All these services and products contribute greatly to environmental conservation activities of customers. In this sense, we believe that our business activities are linked directly with environmental conservation.

Waste Gas Treatment Plants and Equipment

The company uses its unique technology for deodorization, dust collection, desulfurization, denitration and dioxin removal. It specializes in sealing off sources of odor for sewage treatment facilities.

We have started delivery of covers made of specialty fluoropolymer membrane, and have gained a reputation in simplicity and convenience, low cost and recyclability. "SUNSEP™," our dehumidifier for gas analysis, is compact and needs no electricity.

Water Treatment Plants

We supply desalters using hydrocarbon-based ion-exchange membrane as the key to wastewater facilities. The ion-exchange membrane excels in function of concentrating dissolved inorganic salts, and eliminates salts from percolated water. We also supply electrolytic hypochlorite water producing equipment for on-site sterilization and sterility in food plants, etc.

Soil Decontamination

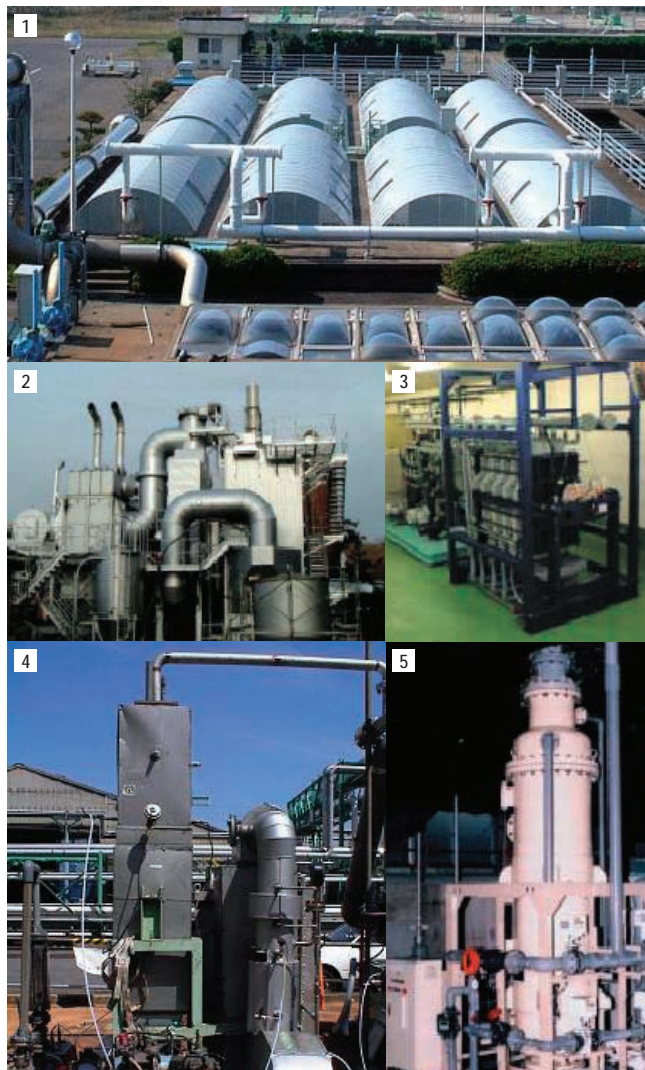
Asahi Glass Engineering was acknowledged as an "Organization for Environmental Survey Specified by the Environment Ministry." Asahi Glass Engineering Co., Ltd., provides total solutions such as survey of contamination conditions, drafting of decontamination planing, execution of countermeasure construction works, purification equipment control, and monitoring after countermeasures are taken.

Recycling

Possessing the equipment and technologies for comprehensive recycling systems, the company widely supplies equipment and technologies required for recycling industrial waste and recovering items of value.

Chemicals for Environmental Conservation

Asahi Glass Engineering Co., Ltd., provides chelate solution, chelate resin, and activated carbons for effective elimination of mercury, cadmium, etc., through selective bonding with heavy metal ions for service water and sewage water and other industrial purposes.

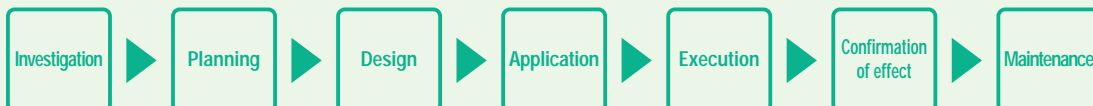


1. Sealing equipment using fluorocarbon resin film as a deodorization measure in sewage treatment plants, and measure for preventing generation of algae in sewage treatment facilities
2. Removal equipment for dioxin, hydrogen chloride, and dust contained in waste gas from industrial waste incinerators
3. Desalter that removes salts using hydrocarbonic ion-exchange membrane
4. Equipment for decomposition of high-concentration Volatile Organic Compound (VOC), one of the purifying devices for soil and groundwater
5. Compaction filter system that purifies public water and wastewater through high-speed, high-precision filtration

Environmental Conservation Activities

The Chiba Plant acquired ISO 14001 Certification in June 2003, Asahi Glass Engineering Co., Ltd., is engaged in operation of the environmental management system aiming to attain sound environmental performance.

Flow of solution service for measures to purify soil and groundwater :



Environmental Performance Data of Research Center, Plants, and Major Affiliates in Japan

Note: Data on major affiliates in Japan has been included in the chart since 2002.

Emission into Air

CO₂ (Unit: × 10³ t - CO₂)

Establishment	2002	2001
Research Center	6	6
Kashima	658	641
Chiba	521	481
Funabashi	112	179
Keihin	159	116
Sagami	49	47
Aichi	330	335
Kansai	101	106
Takasago	177	182
Kitakyushu	133	282
Major affiliates	2002	2001
Asahi Fiber Glass Co., Ltd.	233	
Asahi Techno Glass Corporation	91	
Asahi Glass Ceramics Co., Ltd.	12	
Ise Chemicals Corpoartion	24	

NO_x (Unit: t)

Establishment	2002	2001
Research Center	0.3	0
Kashima	580	565
Chiba	836	436
Funabashi	1,070	1,560
Keihin	153	107
Sagami	11	8
Aichi	798	1,040
Kansai	422	410
Takasago	1,500	1,349
Kitakyushu	160	285
Major affiliates	2002	2001
Asahi Fiber Glass Co., Ltd.	1,000	
Asahi Techno Glass Corporation	640	
Asahi Glass Ceramics Co., Ltd.	2	
Ise Chemicals Corpoartion	*1	

SO_x (Unit: t)

Establishment	2002	2001
Research Center	0	0
Kashima	26	48
Chiba	76	105
Funabashi	9	17
Keihin	6	3
Sagami	0	0
Aichi	410	561
Kansai	13	17
Takasago	28	42
Kitakyushu	64	80
Major affiliates	2002	2001
Asahi Fiber Glass Co., Ltd.	1,400	
Asahi Techno Glass Corporation	188	
Asahi Glass Ceramics Co., Ltd.	0	
Ise Chemicals Corpoartion	*1	

Soot and dust (Unit: t)

Establishment	2002	2001
Research Center	0	0
Kashima	31	11
Chiba	73	41
Funabashi	5	12
Keihin	1	0.6
Sagami	0.1	0.1
Aichi	68	72
Kansai	6	5
Takasago	9	40
Kitakyushu	9	33
Major affiliates	2002	2001
Asahi Fiber Glass Co., Ltd.	41	
Asahi Techno Glass Corporation	34	
Asahi Glass Ceramics Co., Ltd.	1	
Ise Chemicals Corpoartion	0	

*1: No concerned equipment



[Appendix]
Environmental Performance Data of Research Center, Plants, and Major Affiliates in Japan



Emission into Water

Total volume of wastewater (Unit: $\times 10^3$ m³)

Establishment	2002	2001
Research Center	48	43
Kashima	7,318	7,568
Chiba	12,782	17,965
Funabashi	994	984
Keihin	1,227	1,253
Sagami	158	140
Aichi	2,322	2,244
Kansai	373	444
Takasago	1,128	980
Kitakyushu	61,431	77,148
Major affiliates	2002	2001
Asahi Fiber Glass Co., Ltd.	1,200	
Asahi Techno Glass Corporation	1,830	
Asahi Glass Ceramics Co., Ltd.	460	
Ise Chemicals Corporation	23,800	

COD (Unit: t)

Establishment	2002	2001
Research Center	0	0.3
Kashima	984	1,069
Chiba	65	74
Funabashi	4	4
Keihin	3	5
Sagami	0.4	0.5
Aichi	6	6
Kansai	0.4	2
Takasago	3	2
Kitakyushu	49	121
Major affiliates	2002	2001
Asahi Fiber Glass Co., Ltd.	36	
Asahi Techno Glass Corporation	3	
Asahi Glass Ceramics Co., Ltd.	0.8	
Ise Chemicals Corporation	1,000	

Waste

Amount of final disposal of waste (Unit: t)

Establishment	2002	2001
Research Center	453	383
Kashima	1,585	3,654
Chiba	2,274	2,891
Funabashi	676	632
Keihin	608	1,001
Sagami	95	81
Aichi	284	475
Kansai	17	98
Takasago	440	5,613
Kitakyushu	2,996	33,388
Major affiliates	2002	2001
Asahi Fiber Glass Co., Ltd.	4,000	
Asahi Techno Glass Corporation	1,100	
Asahi Glass Ceramics Co., Ltd.	1,000	
Ise Chemicals Corporation		

Observance of Environmental Regulations and Accidents

Regarding accidents during distribution for 2002, one case resulted from a traffic accident where there was a slight leakage of CFC gas from the cylinder, but caused no serious problem.

Other Accidents

A small fire at the Kansai Plant in September 2002 involved no harm or injury.

PRTR¹

Substances Reported, Volume of Release, and Transfer Volume (Unit: kg [Dioxin = mg-TEQ])

Establishment	Names of Chemical Substances	2002			2001		
		Release to the Atmosphere	Release to Public Water Area	Transfer	Release to the Atmosphere	Release to Public Water Area	Transfer
Research Center							
Kashima	Zinc compounds (water-soluble)	0	0	2,600	0	1,300	0
	Antimony and its compounds	0	0	5,000	0	0	10,000
	Epichlorohydrin	5,400	0	0	4,900	0	0
	Propylene oxide	120,000	0	0	98,000	0	0
	Xylene	48,000	0	19,000	50,000	0	18,000
	HCFC-22	38,000	0	0	58,000	0	0
	Allyl chloride	15,000	0	0	15,000	0	0
	Chloroform	21,000	0	26	18,000	120	0
	Methyl chloride	21,000	0	0	130,000	0	0
	Tetrachloromethane	32,000	0	2	42,000	88	0
	HCFC-123	0	0	0	13,000	0	0
	HCFC-21	6,700	0	0	15,000	0	0
	1,2-dichloropropane	91,000	0	290	130,000	330	0
	Dichlobenil	0	0	0	0	0	76
	HCFC-225	34,000	0	0	40,000	0	0
	Methylene dichloride	36,000	0	92	42,000	49	0
	Dioxins	8.1	0	3.4	32	17	0
	Tetrafluoroethylene	54,000	0	0	34,000	0	0
	CFC-113	3,400	0	0	5,400	0	0
	CFC-11	0	0	0	1,400	0	0
Lead and its compounds	0	0	2,600	0	0	2,700	
Hydrogen fluoride and its water-soluble salts	0	0	48	0	47	0	
Chiba	Acrylic acid	0	0	0	0	0	0
	2,2'-azobisisobutyronitrile	0	0	4			
	Antimony and its compounds	0	0	9,000	0	0	7,400
	Ethylbenzene	1,500	0	0	1,400	0	0
	Ethylenediaminetetraacetic acid	0	0	0	0	0	0
	Xylene	4,200	0	95	4,000	0	0
	Vinyl chloride	1,200	0	0	1,200	0	0
	HCFC-142b	4,400	0	0	820	0	0
	HCFC-22	29,000	0	0	67,000	0	0
	Chloroform	27,000	0	0	57,000	0	0
	Methyl chloride	8,900	0	0	7,000	0	5,300
	Tetrachloromethane	15,000	0	0	11,000	0	0
	1,2-dichloroethane	5,000	0	0	7,500	0	0
	Vinylidene dichloride	0	0	0	0	0	0
	HCFC-141b	29,000	0	230	14,000	0	1,200
	HCFC-21	100	0	0	3,900	0	0
	HCFC-225	28,000	0	7,100	29,000	0	1,000
	Methylene dichloride	63,000	0	1,300	55,000	0	2,100
	N,N-dimethylformamide	0	0	0	7,700	0	360
	Dioxins	7	6.9	1.3	9.4	1.6	2.4
	Tetrachloroethylene	430	0	0	630	0	19
	Tetrafluoroethylene	120,000	0	0	89,000	0	0
	1,1,2-trichloroethane	6,100	0	0			
	Trichloroethylene	2,600	0	12	790	0	4,200
	CFC-113				690	0	1
Nickel	0	0	20	0	0	130	
Nickel compounds	0	0	0	0	0	0	
Hydrogen fluoride and its water-soluble salts	0	0	400	0	0	180	
Hexamethylene diisocyanate	0	0	0	0	0	0	
Funabashi	Antimony and its compounds	280	110	900	400	89	2,200
	Lead and its compounds				1,400	20	330,000
	Nickel compounds	0	4.9	11	0	4.9	24
	Boron and its compounds				350	980	2,600
Keihin	Boron and its compounds	8,500	580	0	5,700	390	840
Sagami	Lead and its compounds				0	0	2.6
	Chromium and chromium(III) compounds				0	0	1.5
Aichi	Nickel compounds	0	0.5	0	0	0.5	0
	Lead and its compounds	0	0	1,040	0	0	2,400
	Chromium and chromium(III) compounds	0	0	570	0	0	650
Kansai	Barium and its water-soluble compounds	2.4	0	0	2.0	0	0
Takasago	Antimony and its compounds	90	350	0	88	280	160
	Chromium and chromium(III) compounds	0	7.5	560	3,000	4.8	1,700
	Chromium(VI) compounds	0	6.6	6	0	5.8	4.2
	Dioxins	13	0	0.14	39	0.0000019	0.047
	Lead and its compounds	870	18	33,000	670	11	12,000
	Nickel compounds	6	3.3	89	5.6	2.7	100
	Boron and its compounds	34	320	3,900			
Kitakyushu	Lead and its compounds				0	25(landfill)	740

*1: PRTR: Information disclosure based on Pollutant Release and Transfer Register (PRTR) requiring enterprises to report to the authorities the volume of emission into air, water, and soil, and the volume of their transfer for disclosure on 354 chemical substances specified by the government. " " indicates figures are not applicable.



Voices of Readers of Environmental Report 2002

We have received many invaluable opinions from readers about Environmental Report 2002.

The table at right details contents of respondents said they were impressed by and interested in.

The item attracting the most interest was "Major to Reduce Industrial Waste." Asahi Glass is now engaged in a zero emission campaign, and such great reader concern with the matter is highly encouraging.

Great interest was also shown in "Environmental Activities at Individual Establishments," included for the first time in our Report for local residents. We realize the importance of disclosing such individual data.

Despite the rather high evaluation respondents give in "Representative Opinions," we believe many improvements remain to be made.

We have reflected reader opinions in planning future environmental activities and in the editing of the current Environmental Report. Thank you very much for your cooperation.

Contents that impressed or interested the readers

1. Message from the President	1
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16. Commendation and Assistance for Environmental Efforts	5
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Total	114

Including multiple answers

Representative Opinions

I think it would be much better if there were a target set for environmental burdens instead of only transition, as in the case of the control of chemical substances. I wish there had been some explanation, even if only of key points, about why the waste reduction target could not be attained. It would be better if there were graphs to show changes in volume of chemical substances released by each plant into the air and water. It was good that the status quo of the emission per plant was summarized. (Association Clerk)

I could clearly see the stance in the Environmental Report here and there that the report has been compiled for local residents. If that were the stance of the Report, however, it would have been much better if items on air, water, and soil contamination were described more precisely on pages introducing pollution at each plant, since they are items local residents are much concerned about. (Bank Clerk)

The Environmental Report is good in the point that it deals with the environmental conservation and action policies. Since the Report contains quite a few difficult technical terms, it was difficult to follow. Activities on energy saving and measures against global warming, etc., showed that the company is taking positive measures to solve environmental problems. I was favorably impressed with the substantial security measures taken even in the distribution stage. Another thing that impressed me deeply was the environmental education program for employees and community activities at each plant. I wish there were a report for the general public written in plainer language. Hopefully, community activities will continue. (Junior High School Teacher)

Observer's Opinion

Nontransparent Materials Industry

Unlike manufacturers of automobiles, electronic home appliances, and items in daily use, the materials industry has an almost invisibly low profile. In the case of electric home appliances, for example, customers look at the products from different angles at purchase such as energy saving, use of recyclable material, parts or media free from hazardous substances, etc. Quite naturally, they notice the management policy and environmental activities of product manufacturers. In the materials industry, which manufactures glass, electronic parts, chemical substances, building materials, etc., that are not directly visible, however, it is a key point that Environmental Reports contain contents that are substantial and easy to understand.

Site Report 2003

In this respect, the Site Report (activities of research center, plants, and affiliates) in Environmental Report 2003 has made marked progress over the preceding Report. The Site Report gives a clear, precise description of "what kind of product is produced by which plant under what concept and paying what sort of consideration to the environment." So far, local residents were unaware of, and therefore concerned about, "what kind of product the plant produces using what kind of materials, and what chemical substances are released, etc." Environmental Report 2003 has thrown light to some extent to these points, I believe.

Lengthy Company Report

The corporate-wide environmental policies, environmental management system, and activities for reducing environmental impact in the first half of Environmental Report 2003, however, appear as vague as ever, which might be attributed to describing all business collectively and becoming too abstract. The Report starts with shared values and basic environmental policies of Asahi Glass, and details numerical achievements and objectives in environmental accounting and activities for reducing environmental impact. This lengthy description of facts does nothing to clarify the attitude of the company toward how it evaluates the analytical results of numerical achievements or how it plans to deal with and reflect results in future management and environmental measures. Only after these points are clarified will the Environmental Report be "reader-friendly" in the true meaning of the word.

Conclusion

I understand that the environmental activities of Asahi Glass are in the process of developing and, as such, so is the Environmental Report. Hopefully, the company will make steady progress in this regard, and not be content with simply publishing something entitled an Environmental Report. It should take every opportunity to reflect achievements thus obtained in the Environmental Report for the next year. In planning and preparing this Environmental Report, the Center for Environmental Information Science gave advice and instructions from the standpoint of a reader, but we are not involved in checking the adequacy of disclosure of information, including figures and disadvantageous information.



Osamu Murakami

Chief Researcher
Center for Environmental Information
Science

Center for Environmental Information Science

Established in 1972, the Center for Environmental Information Science is engaged in the development and dissemination of environmental science and in investigation and research in academic societies as a nonprofit foundation licensed by the Ministry of the Environment.

Main Business Activities

Publication of "Environmental Information Science"

Holding of symposiums, lectures, etc.

Collection and analysis of domestic and overseas information and materials about environmental science

Investigation and research on trust in environmental science

Autonomous research by an Expert Committee composed of members from different fields

Exchange of views and communication with overseas research institutions

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