



# 2005

R E S P O N S I B L E C A R E R E P O R T



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# Company Outline (as of March 31, 2005)

<b>Company Name</b>	Sumitomo Seika Chemicals Company Limited
<b>Head Offices</b>	Osaka: 4-5-33 Kitahama, Chuo-ku, Osaka, Japan Tokyo: 1-13-5 Kudan Kita, Chiyoda-ku, Tokyo, Japan
<b>Website</b>	<a href="http://www.sumitomoseika.co.jp/">http://www.sumitomoseika.co.jp/</a>
<b>Established</b>	July 1944
<b>Capital</b>	¥9,698 million
<b>Sales</b>	¥41,716 million (consolidated) ¥34,729 million (non-consolidated)
<b>Employees</b>	690

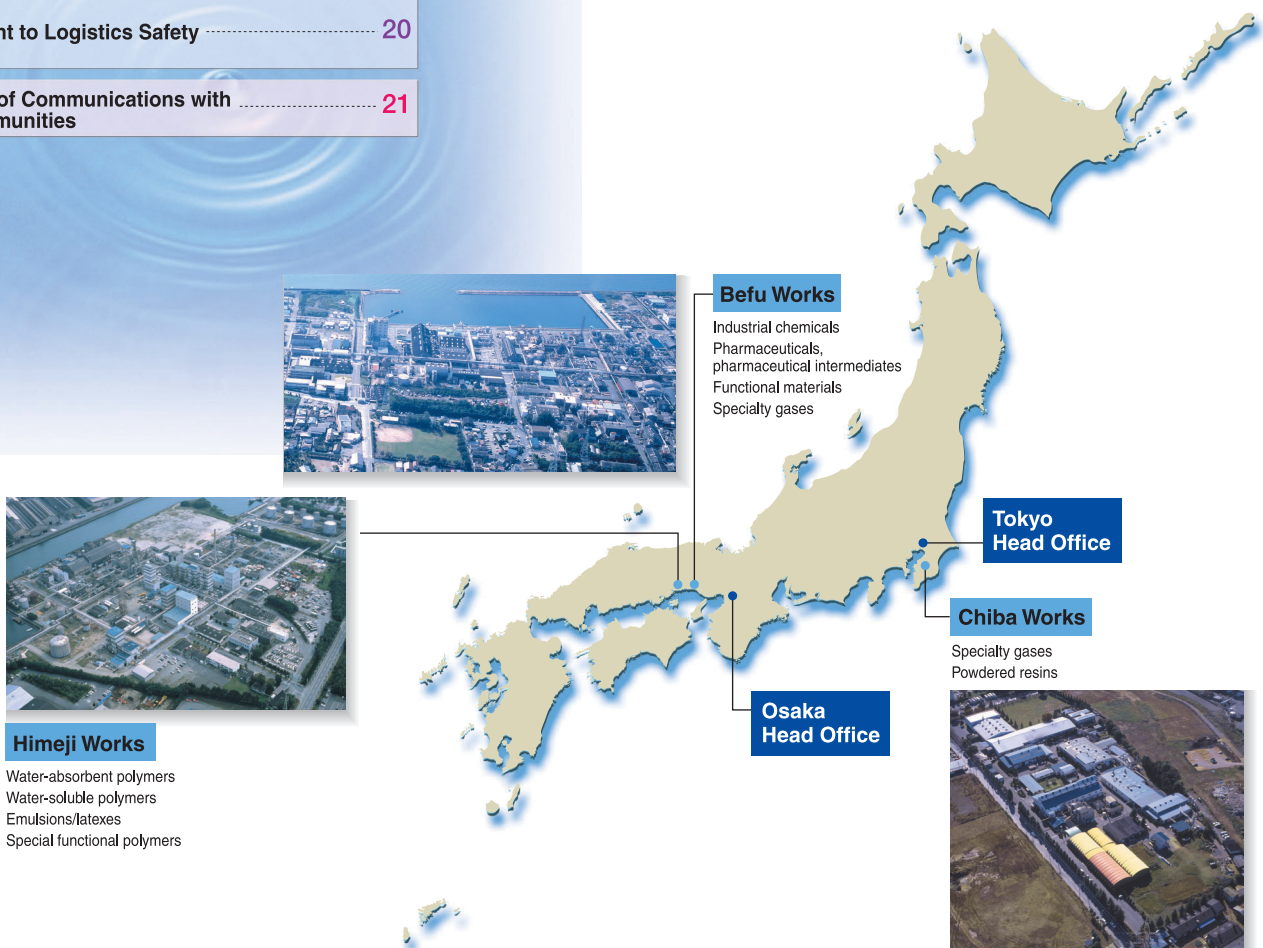
## Major Lines of Business

Fine Chemicals Division	: Raw material products for pharmaceuticals, functional materials, various industrial chemicals
Functional Polymers Division	: Water-absorbent polymers, water-soluble polymers, emulsions, powdered resins
Gases Division	: Gases for semiconductor device production, standard gases, gases for medical use PSA gas generators, electronics industry equipment

## Works

Befu Works	346-1 Miyanishi, Harima-cho, Kako-gun, Hyogo, Japan
Himeji Works	1 Irifune-cho, Shikama-ku, Himeji City, Hyogo, Japan
Chiba Works	1384-1 Kamikoya, Yachiyo City, Chiba, Japan

# Locations in Japan





## Message from the President

# Protecting the Global Environment and Assuring Safety

Business enterprises are the driving force behind global economic activity. To ensure their ongoing contribution to the goal of achieving a sustainable society, they must contribute broadly to society while actively complying with all laws and regulations, ensure the safety of their operations, preserve the environment, and maintain harmonious relations with neighboring communities.

Looking to the new challenges we have taken on since fiscal 2004, we have adopted voluntary environmental protection initiatives to reduce global warming in response to the implementation of the Kyoto Protocol. At the same time, we are working to improve the atmosphere by controlling the release of nitrogen oxides and particulate matter from automobiles, reducing emissions of volatile organic compounds, utilizing waste effectively, and disposing of it properly.

Regarding process safety and disaster prevention, we have steadily adopted voluntary measures to prevent industrial accidents.

So far, we have been addressing issues associated with the environment and safety in accordance with our fundamental management policy that consists of the following principles.

- 1) **Provide useful products for society.**
- 2) **Make efforts to alleviate environmental loads, based on a long-term vision.**
- 3) **Prevent accidents and disasters and assure the safety of local communities and our employees.**

In the areas of the environment and safety, we have focused our corporate activities on environmental protection and safety assurance through the adoption of Responsible Care, a set of voluntary initiatives to ensure a responsible approach throughout the entire product lifecycle from development to final disposal.

This, the 2005 edition of our *Responsible Care Report*, summarizes Sumitomo Seika's activities during fiscal 2004 and outlines our plans for fiscal 2005 with a focus on the following three initiatives:

- 1) **strengthening of zero-accident and zero-injury measures;**
- 2) **conserving energy and reducing air pollution; and**
- 3) **increasing the effective utilization of waste.**

We trust this report will serve to clarify our environmental and safety initiatives as we seek to steadily improve our environmental protection and safety assurance efforts. We look forward to your continued support as we pursue this endeavor.

October 2005



**Ryuichi Sonoda**  
President  
Sumitomo Seika Chemicals Company Limited

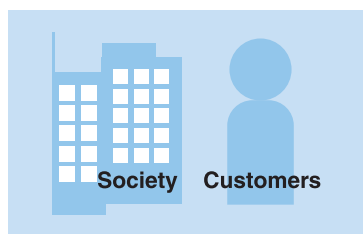
## What Is Responsible Care?

Responsible Care activities are voluntary management activities in which *environment, safety, and health* are addressed for the entire life cycles of products to implement improvement measures. The global chemical manufacturing industry is working to promote these efforts.

Responsible Care activities are generally categorized into five aspects—environmental protection, security and accident prevention, occupational safety and health, chemicals safety and logistics safety.



Community dialog meeting sponsored by JRCC (Himeji City, Hyogo)



### Responsible Care Symbol



This symbol has been designed as "both hands and a molecular model" to show "careful handling of chemical substances." The symbol was determined by the International Council of Chemical Associations (ICCA) as a mark for use by enterprises and associations that are committed to responsible care activities. Use of this mark is permitted only to the national chemical industry associations that belong to ICCA and their members.

In Japan, this mark can be used only by the Japan Chemical Industry Association (JCIA), the Japan Responsible Care Council (JRCC) and JRCC member companies.

## Corporate Policy on the Environment and Safety

### Corporate Policy on Quality, Environment and Safety

Sumitomo Seika fulfills its responsibility to manufacture and supply a variety of unique and high-quality products utilizing innovative and advanced chemical technologies, and contributes to the growth of society, by managing its activities on the basic principles of (i) ensuring "customer satisfaction," (ii) maintaining "zero-accident and zero-injury operations" and (iii) promoting "co-prosperity with society."

With due respect to these principles, especially on the occasion of product development and supply in the future, our Company is determined to conduct all activities in accordance with the following policy related to quality, environment and safety.

- 1** To provide consistently trustworthy products and services of the highest quality along with customer service and satisfaction.
- 2** To maintain zero-accident and zero-injury and the safety of our neighboring communities and employees.
- 3** To maintain the safety of raw materials, intermediates and products, and prevent our customers, consumers, distributors and employees from being exposed to any possible hazard.
- 4** To continually assess and reduce the environmental loads at all operational stages, from product development through to disposal with objective, to protect the environment.

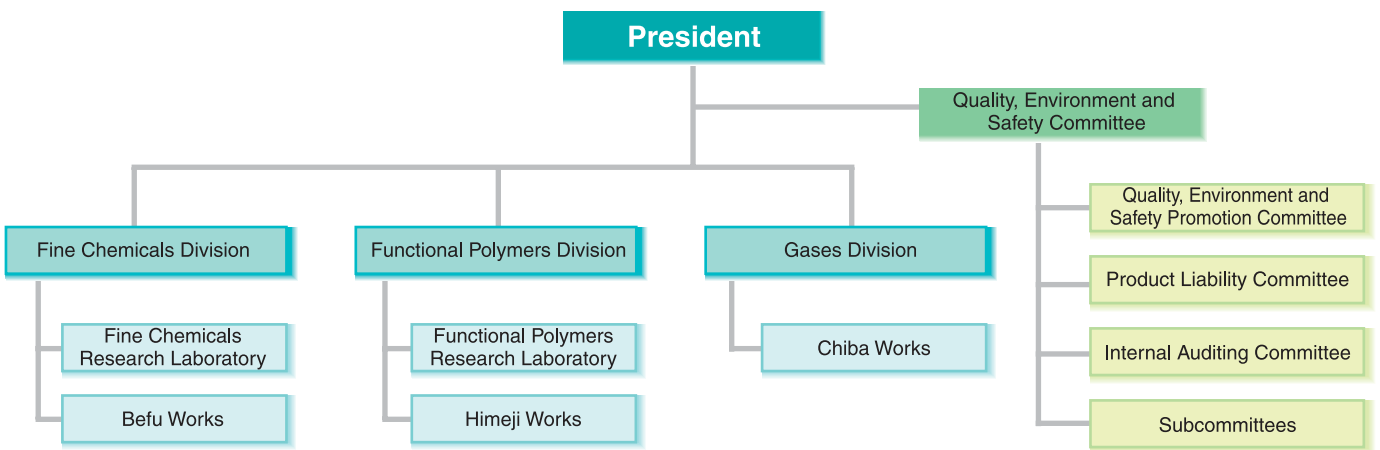
All sections and employees of our Company shall be fully aware of the significance of this policy and shall always improve operational performance, while of course abiding by laws, regulations and standards.

(Established March 1995, and revised June 1999, March 2001 and July 2003)

In 1995, Sumitomo Seika declared its commitment to promoting Responsible Care activities and established its Corporate Policy on Quality, Environment and Safety. This business management policy gives priority to specific objectives—customer satisfaction, zero accidents and disasters, and reduction of environmental loads over the life cycle of every product. To promote our efforts for attaining these goals, we require all our employees to strictly observe laws and regulations and continuously strive to make further improvements.

# Organization and System for the Environment and Safety

In order to promote Responsible Care activities effectively and efficiently, Sumitomo Seika has established a Quality, Environment and Safety Committee that is chaired by the director in charge of Responsible Care (RC). The committee also includes directors from each division. The specific Responsible Care activities of the entire company are decided by the Quality, Environment and Safety Promotion Committee, which is comprised of general managers.



**Quality, Environment and Safety Committee**

- Development and redefinition of corporate policies
- Development of long-term and annual plans
- Reporting to the Japan Responsible Care Council

**Reduction of environmental loads**

- Promotion of energy conservation
- Waste reduction, reuse, recycling
- Reduction of chemical substances released

**Assurance of chemicals safety**

- Assurance of safety for customers
- Assurance of safety during transportation
- Evaluation of physical properties of products

**Assurance of safety, security and accident prevention**

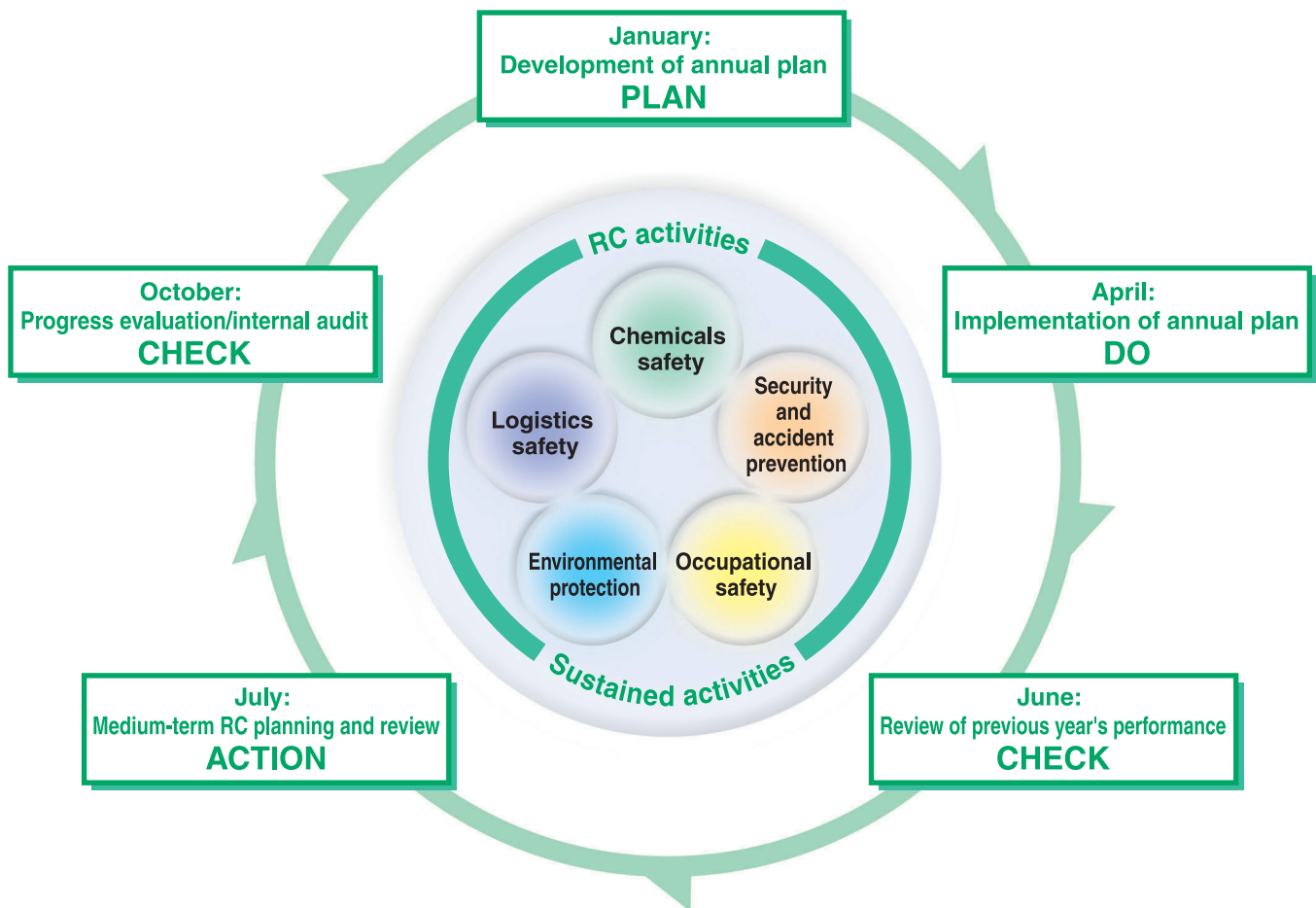
- Assurance of safe operation
- Promotion of security and accident prevention programs
- Evaluation of material safety

## Environment and Safety Management System

The requirement of Responsible Care activities is the voluntary planning, execution and review in management cycles that steadily achieve improvements. Sumitomo Seika is executing Responsible Care activities in one-year cycles in the fields of environmental protection, security and accident prevention, occupational safety, chemicals safety and logistics safety.

### Sumitomo Seika's Management System

Each one-year management cycle for Responsible Care (RC) activities begins in April and consists of Plan, Do, Check and Action stages.



### Enhancing and Strengthening the Management System

In fiscal 2004, Sumitomo Seika acquired ISO 14001 certification—the international standard for environmental management systems.

### Auditing System

The current progress of Responsible Care plan implementation is inspected every year for each Sumitomo Seika works. The findings are reflected in the plan for the next fiscal year in order to help realize continual improvement.

# Acquisition of ISO 14001 Certification

In order to proceed with our Responsible Care activities efficiently, all our works had acquired ISO 14001 certification for environmental management systems in fiscal 2004. Furthermore, Sumitomo Seika had already acquired company-wide ISO 9001:2000 certification for the quality management system.

Works	Month and year of certification acquisition	Standard designation	Certifying agency
Befu Works	June 2004	ISO 14001:2004	*1 JCQA
Himeji Works	May 2004	ISO 14001:2004	JCQA
Chiba Works	June 2004	ISO 14001:2004	JCQA
Sumitomo Seika (company-wide)	December 1996	ISO 9001:2000	JCQA
Engineering Division	June 1997	ISO 9001:2000	*2 LRQA

\*1 JCQA: Japan Chemical Quality Assurance Ltd.

\*2 LRQA :Lloyd's Register Quality Assurance Limited



Document review

On-site review



ISO 14001 certificate

## ●● Responsible Care Auditing

We examine the current progress of the responsible care plans of each Sumitomo Seika works every year. These findings are reflected in the plans for the next fiscal year in order to help realize continued improvement. In addition, to verify that our environmental and quality management systems are functioning correctly, we execute ISO internal environmental and quality auditing.



# Fiscal 2004 Environmental Protection and Safety Activities and Achievements

Our fiscal 2004 targets and achievements for environmental protection, occupational safety, security and accident prevention, logistics safety and chemicals safety are summarized below. For fiscal 2005, we are making further efforts based on our progress in fiscal 2004.

## ●● Main Efforts and Results in Fiscal 2004

Theme	Target	Fiscal 2004 achievement	Fiscal 2005 objective	Details
Energy conservation	1% reduction in the energy basic unit rate Consideration of new ways of reducing greenhouse gas emissions	The Himeji Works introduced high-efficiency dryers. The Chiba Works achieved a 2% reduction in energy basic unit rate through a fuel conversion initiative. A greenhouse gas reduction schedule was submitted to the Hyogo Prefectural Government.	1% reduction in the energy basic unit rate Establishment of technologies to reduce greenhouse gas emissions	P11
Wastes	Achievement of a recycling percentage of 30% Reduction in final disposal by landfill by 20% from the fiscal 2003 level	Increased the effective use ratio and reduced the disposal by landfill by focusing on the development of applications for the effective use of sludge originating from the activated sludge treatment facility. Recycling percentage: 52% Final disposal by landfill: Reduced by 47% from the fiscal 2003 level	Reduction in waste emissions from works Reduction in landfilled amount by 10% from the fiscal 2004 level	P12
Chemical substance control	Reduction in amounts of Pollutant Release and Transfer Register (PRTR)-related substances Investigation of emissions of volatile organic compounds (VOCs)	Emissions of substances subject to PRTR increased partially due to the increased production volume. Investigation launched into status of emissions of VOCs.	Reduction in emissions of specified substances Examination of emissions reduction technology for targeted VOCs	P14
Job-related accidents Security and accident prevention	Elimination of job-related accidents and disasters Elimination of fire, explosion and leakage accidents	No job-related accidents that led to suspension of operation Two job-related accidents that did not lead to suspension of operation	Implementation of safety assessments by applying HAZOP analysis Improvement of inspection and upgrading of aging facilities and renew planning	P18 P19
Logistics safety	No transportation-related accidents Provision of safety guidance support for logistics contractors Improvement of transportation system for compressed gases	Improved dedicated transportation system for compressed gas products. Implemented risk assessments for newly transported substances. Instituted joint training with logistics contractors.	No transportation-related accidents Provision of safety guidance support for logistics contractors	P20
Chemicals safety	Prevention of accidents or troubles at customer sites	Implemented safety assessment of chemical substances with high production volumes.	Appropriate and quick responses to regulatory revisions in Japan and abroad	P17
Occupational health and safety	Reduction in rate of absenteeism due to personal injuries and illnesses Reduction of traffic accidents by half	Improved guidance to employees requiring health management accompanying medical check-ups. Countermeasures against traffic accidents • Total number of traffic accidents 43 (previous year: 34) • Number of accidents with injuries 17 (previous year: 20)	Improved guidance in cooperation with industrial physicians Improved employee guidance for driving safety	

# Environment-Related Technologies

Hydrogen is a zero-emissions energy source in the consumption phase. In light of the increasing attention given to the global warming issue, it is expected that hydrogen energy systems will be introduced.

## Development of a Self-Sufficient DME Converting Hydrogen Supply System

Fuel cells are expected to be introduced as a trial method for introducing hydrogen as a energy source. Sumitomo Seika—as part of a joint venture with Electric Power Development Co., Ltd. supported by the Ministry of Economy, Trade and Industry—is

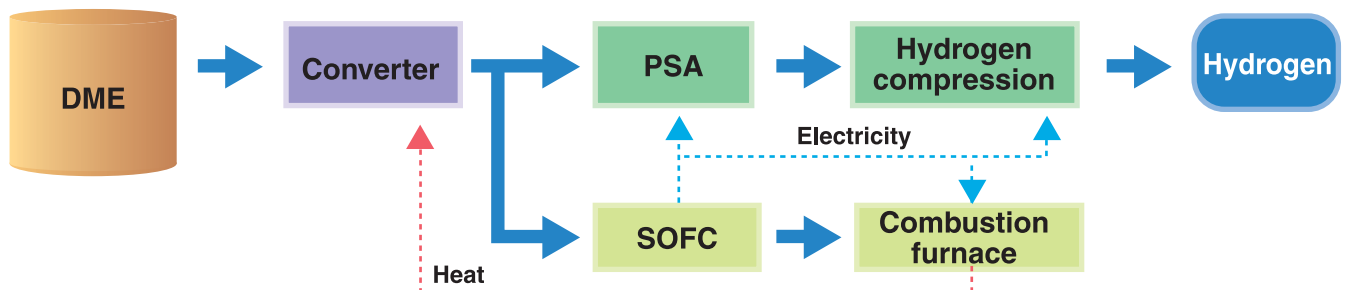
committed to developing a hydrogen fuel supply system for fuel cell vehicles by building hydrogen fueling stations that obtain hydrogen by modifying dimethyl ether (DME).

### [ The System in Development ]

This is an unconventional, novel hydrogen supply system in that:

1. DME is used as a raw fuel (hydrogen carrier);
2. the system is comprised of a DME converter, solid oxide fuel cells (SOFC) and a gas purifier (PSA);
3. the system is capable of maintaining self-sustained operation even if the system power supply from a power utility company is stopped.

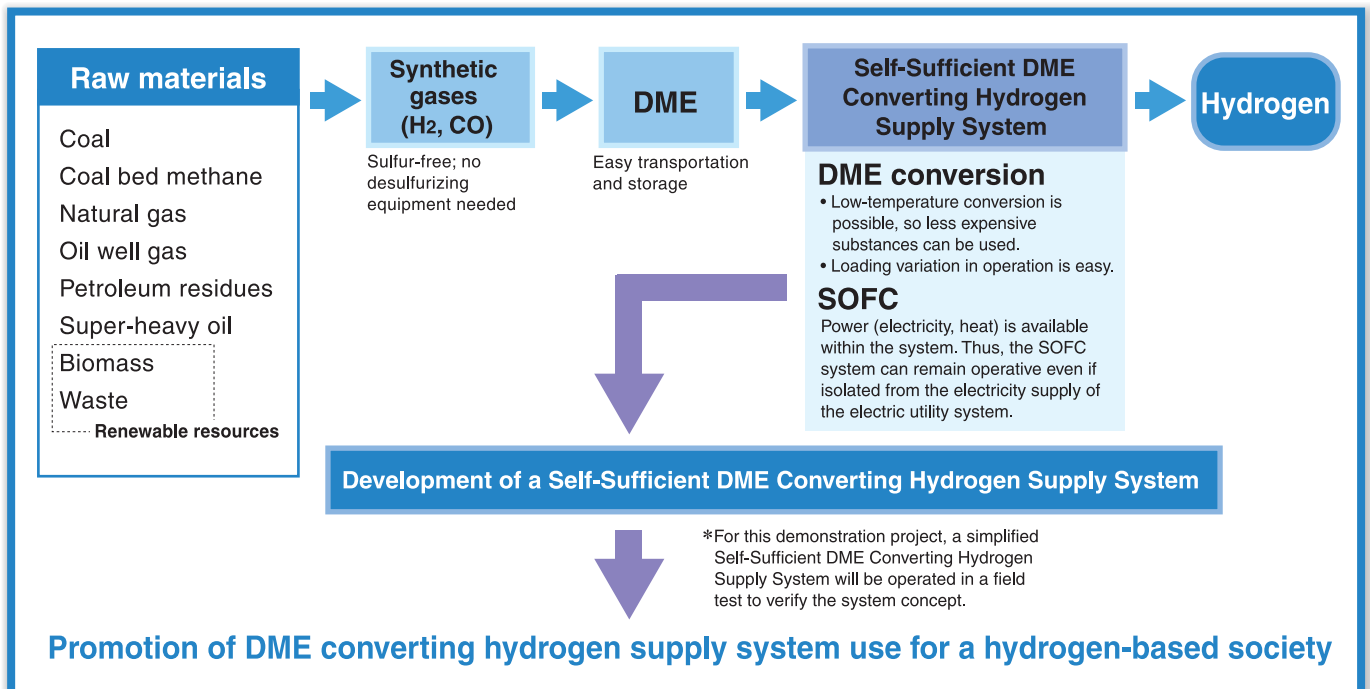
### [ System Overview ]



### [ Development Objectives ]

Field test site: Sumitomo Seika's Himeji Works

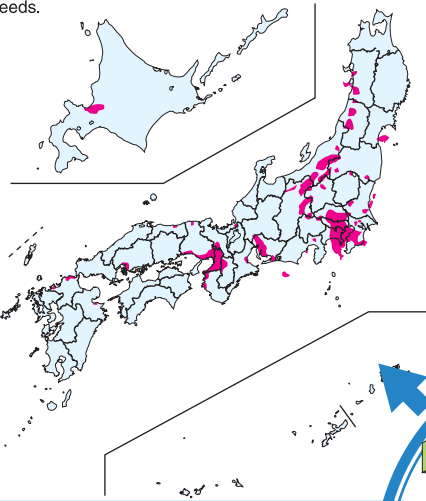
Project period: Fiscal 2003–05



## Application Examples

### System for Regions where City Gas (Natural Gas) Service Is Not Yet Available

As little as 5% of the land area of Japan has a city gas (natural gas) supply. In other words, for 95% of Japan, distributed energy supply systems such as our system, rather than a centralized energy supply system, are practical. Our energy supply system that uses DME as a hydrogen source will be one of the best options for future energy needs.

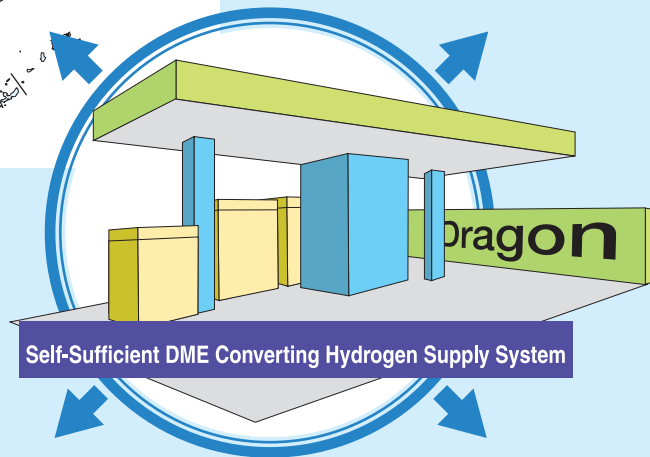


\*Areas in red are regions where natural gas service is available.

Data: "DME Study Meeting Report" from the Liquefied Petroleum Gas Center of Japan

### Disaster Relief-Capable System

It took three months before the lifeline was restored in the aftermath of the 1995 Great Hanshin Earthquake in Japan, but the supply of LP gas was reestablished within three days of the earthquake. Like any LP gas supply system, our DME converting hydrogen supply system is a distributed-type energy system, and, therefore, can provide an effective disaster-proof system that can supply its own electricity and hydrogen as long as DME and water are available.



### System for Remote Island Areas

Without a large sum of investment in infrastructure, this system enables a supply of hydrogen on islands where pipeline construction work is difficult.



### System for Regions where Power Distribution from Power Sources Is Insufficient

This system is useful in mountainous regions and other areas where power distribution from power sources is insufficient.



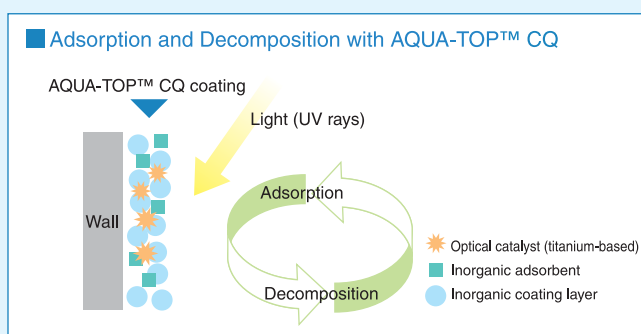
# Sumitomo Seika's Environment-Related Products

Our products are highly regarded and used in various industrial fields because of their functionality and quality. We have also been actively committed to supplying a variety of products that contribute to environmental protection and product safety. Some of our environment-related products are described in this section. We will continue to be committed to the development of products that contribute to society.

## Functional Polymers Division

### AQUA-TOP™ CQ (chemical quencher)

AQUA-TOP™ CQ is an indoor air quality improving paint that adsorbs and decomposes hazardous substances, including formaldehyde, that are regarded as causes of sick-house syndrome, as well as offensive odor-releasing substances.



## Gases Division

### Standard Gases for Analyzing the Atmosphere and Ecosystems

#### [1] HAPs standard gases

Standard gases for monitoring hazardous air pollutants

#### [2] PAMS standard gases

Standard gases for monitoring photochemical smog

#### [3] NMOG standard gases

Standard gases for compliance with new regulations for automotive exhaust gas analysis

#### [4] IAP standard gases

Standard gases for monitoring indoor air pollutants (sick-house syndrome inducing substances)

#### [5] ODOR standard gases

Standard gases for monitoring odorous substances

#### [6] Soil pollution standard gases

Standard gases for monitoring hazardous substances in soil

### General Purpose Standard Gases/ JCSS (Japan Calibration Service System) Standard Gases

Standard gases for monitoring automotive exhaust gas and air pollution



Handling standard gases



Management of standard gas cylinders

### PSA Gas Generator

This PSA (Pressure Swing Adsorption) Gas Generator is used to supply oxygen for energy conservation, to recover greenhouse gases (CO<sub>2</sub> and methane) that contribute to global warming, and to generate hydrogen, which is expected to serve as a clean energy source.



### Combustion-Type Exhaust Gas Treatment System for the Semiconductor Industry: e-SHINE

This system has been specifically designed to decompose the greenhouse gas CF<sub>4</sub>. It realizes low energy consumption operation by incorporating a cooling-rinsing system into the combustion-decomposition process, which is executed with a high-temperature burner.



## Efforts toward Preventing Global Warming

With the goal of improving cost efficiency through resource conservation, Sumitomo Seika has been making a variety of efforts including process improvements, introduction of a cogeneration system (Befu Works, 1989 and Himeji Works, 2002), conversion to new fuels and recovery of waste heat. In fiscal 2004, we increased our production volume and experienced decreased energy efficiency in our product manufacturing; however, the Himeji Works introduced high-efficiency dryers and high-pressure wash water pumps, and reviewed processes, while the Chiba Works implemented a fuel source conversion initiative. As a result, we succeeded in reducing our energy basic unit rate by 2% from the fiscal 2003 level.

As for CO<sub>2</sub> emissions, we measured an increase of 6.8% from the fiscal 2003 level. This resulted from Hyogo Prefecture's review\* of the CO<sub>2</sub> emissions coefficient in fiscal 2004 and from the significant influence of increased production at the Himeji Works.

In response to this situation, we will rapidly introduce measures to reduce emissions of dinitrogen monoxide (marketed as a surgical anesthetic), which has a high greenhouse effect coefficient. We have developed a response plan and have submitted a written proposal to the Hyogo Prefectural Government.

\* Hyogo Prefecture issues an updated CO<sub>2</sub> emissions coefficient for liquid natural gas and electric power in an annual notice. One factor contributing to our increased CO<sub>2</sub> emissions for fiscal 2004 was the prefecture's higher emission coefficient for electric power generation.

### ●● Main Efforts in Fiscal 2004 for Global Warming Prevention

#### ○ Befu Works

Flow meters were installed in the steam pipe network to maintain continued monitoring of the steam consumption of each steam system. Moreover, we established an energy control standard for each facility and attempted to reflect this standard in the operational manual for each facility; however, we were unable to fulfill the target. The energy basic unit rate was reduced by 2.1% from the fiscal 2004 level.

#### ○ Himeji Works

Because of introduction of high-efficiency dryers, renewable of high-pressure wash water pumps as well as full-capacity production of major products, the energy basic unit rate dropped by 2.8%. However, CO<sub>2</sub> emissions increased by 15% following the required review of the CO<sub>2</sub> emissions coefficient and for other reasons.

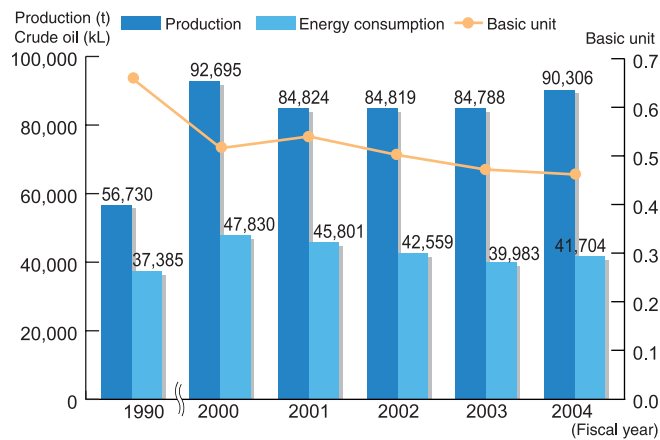
#### ○ Chiba Works

The boiler fuel was converted from heavy oil to natural gas, resulting in a 5.6% reduction in the energy basic unit rate.

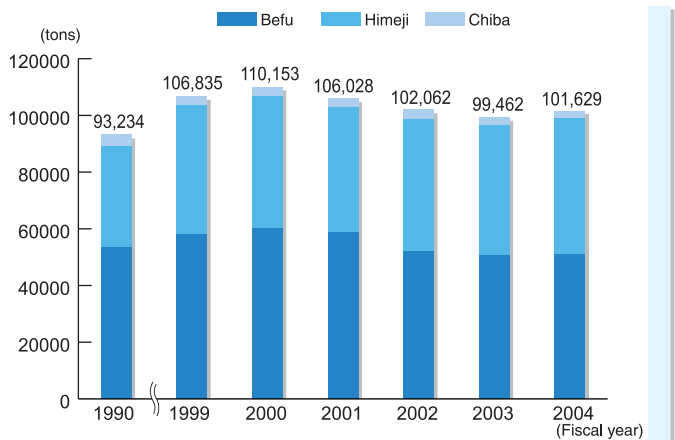


Introduction of a cogeneration system (Himeji Works)

### [ Trend in Production and Energy Consumptions (energy, crude oil equivalent by volume) ]



### [ CO<sub>2</sub> Emissions ]



Note: The basic unit for energy is an index calculated as the [total energy consumption as a crude oil equivalent]/[total production].

\*Total production\* is a concept established in the Law Regarding the Rationalization of Energy Use and is a value based on the energy amount used by a main product in which each product is calculated as an equivalent to this main product. (Actual product weight differs.)

# Efforts to Realize a Recycling-Oriented Society

Sumitomo Seika is committed to waste reduction and recycling according to the principle of "taking responsibility for the disposal of our own waste," believing that waste arising from our business activities should be processed according to this principle.

## ●● Commitment to Waste Reduction

Usually, the products and byproducts (wastes) occurring from chemical reactions are subjected to:

- 1) dehydration, separation and/or concentration;
- 2) utilization by the manufacturer;
- 3) detoxification (wastewater treatment), and/or volume reduction (incineration, etc.).

Then, the residues are commissioned to external waste treatment agents that conduct final disposal.

Believing that the maximum possible reduction in wastes from our plants through these efforts is critical in helping to realize a recycling-oriented society, we remain deeply committed to:

- 1) mandating research into byproduct reduction in the new product development phase;
- 2) inhibition of waste occurrence by improvement of existing processes;

- 3) waste volume reduction with volume-reduction equipment use onsite; and
- 4) preference in commissioning waste to external disposal agents that are more committed to waste utilization.

Through these efforts, we have been attempting to achieve two parallel objectives—waste reduction and waste utilization. In fiscal 2004, we emphasized:

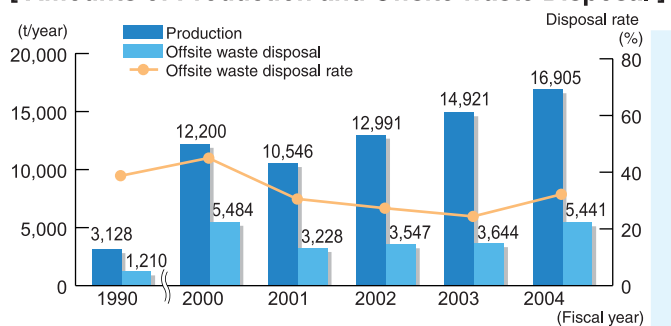
- improvement of the recycling rate (utilization of wastes); and
- reduction of the amount of waste disposal by landfill.

To achieve these goals, we utilized wastes that had been previously disposed of by landfill as raw materials for fertilizer and, as much as possible, commissioned wastes that could be disposed of by incineration to waste heat recovery agents. Thereby, we succeeded in increasing the recycling rate by 15% and reducing the amount of waste finally disposed of in landfills in fiscal 2004 by 48% from the fiscal 2003 level.

## ●● Amounts of Waste Produced and Offsite Waste Disposal

The amount of waste produced by Sumitomo Seika in fiscal 2004 increased by 13% over the fiscal 2003 level because of increased production. Although we made an effort to promote on-site waste utilization and reduce the volume of waste, the amount of waste disposed of off-site increased by about 1.5 times over the fiscal 2003 level. As a result, we intend to adopt even more stringent targets for reducing the amount of offsite disposal.

### [ Amounts of Production and Offsite Waste Disposal ]



The major contributing cause of increased waste in fiscal 2004 was the amount of waste-liquids occurring from the increased production of intermediate products for new pharmaceuticals in fine chemicals production processes.

## ●● Reduction in Final Disposal by Landfill

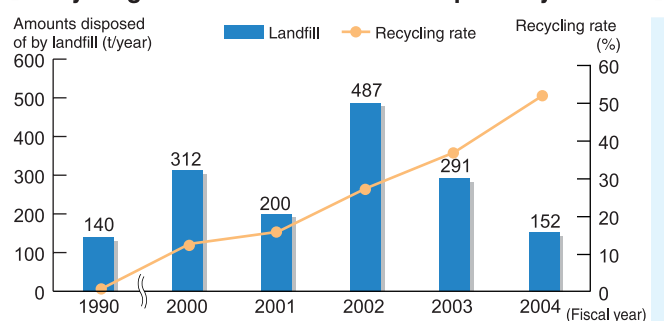
Since fiscal 2003, we had been seeking an alternative measure to the disposal by landfill of the active sludge produced by our Himeji Works. In fiscal 2004, the scope of utilization of the active sludge as a raw material for cement and fertilizer greatly expanded. Thus, we significantly decreased the amount of active sludge that is disposed of by landfill.

## ●● Improvement of the Waste Recycling Rate (Utilization)

The most common wastes produced by Sumitomo Seika are waste-liquids. Though certain types of waste-liquids can be converted into useful products through regenerative distillation processes, in the past, most waste-liquids had been disposed of by incineration as a means of volume reduction. In recent years, however, the popular desire to become a recycling-oriented society has been growing. Therefore, in order to achieve positive utilization of our waste-liquids, we have been seeking agents that can utilize them as auxiliary fuels, as neutralizing and reducing agents, and in thermal recycling processes (utilization of waste heat).

As a result, we succeeded in improving the recycling rate by 15 points in fiscal 2004, and we effectively utilized 52% of waste in some form.

### [ Recycling Rates and Amounts of Disposal by Landfill ]



Waste-incinerating volume-reduction plant



Collection of carefully classified wastes

## Air Pollutant Reduction

**Air pollution in large cities still poses a serious problem. To address this problem, the Air Pollution Control Law of Japan stipulates emission controls of sulfur oxides (SOx), nitrogen oxides (NOx) and particulate matter for factories and automobile exhaust gases. In addition, the Law Concerning Special Measures for Total Emission Reduction of Nitrogen Oxides and Particulate Matter from Automobiles in Specified Areas was established and came into effect in fiscal 2003.**

### ••• Commitment to Air Pollution Prevention

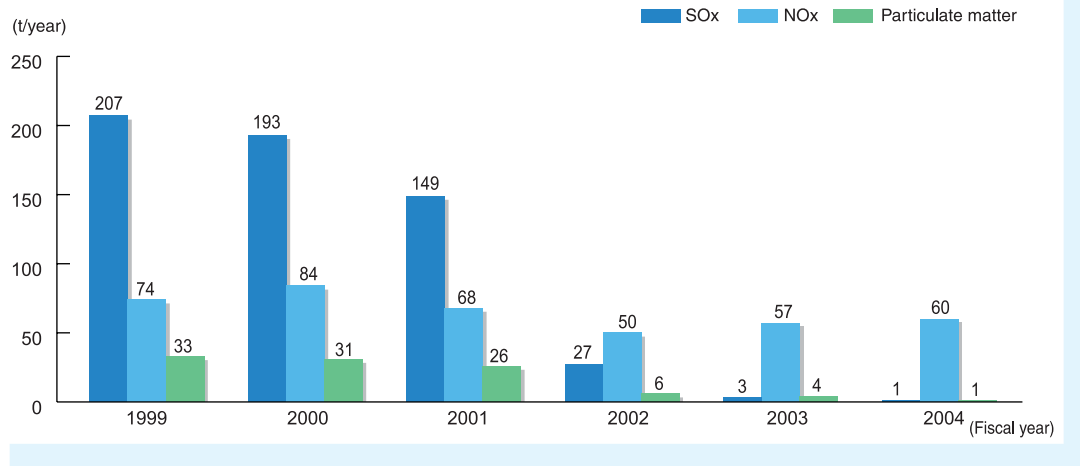
Sumitomo Seika has not only been operating its plants so that the amounts of air pollutants released by them do not exceed the control levels specified in the Air Pollution Control Law but has also been making efforts to reduce the amounts of these emissions in accordance with its voluntarily imposed control levels.

We significantly decreased the emissions of SOx, NOx, and particulate matter from our plants. In fiscal

2004, we made efforts to reduce emissions through fuel conversion and by replacing fire-fighting vehicles and other vehicles.

For fiscal 2005, we have decided to launch a plan to reduce emissions of volatile organic compounds (VOCs) by 30% from the fiscal 2000 levels by 2010. This initiative complies with a new government ordinance to control VOCs.

### [ Emissions of Three Air Pollutant Types ]



This cogeneration facility also contributes to reducing the amounts of SOx and particulate matter (Befu Works)

# Efforts to Reduce Chemical Substance Emissions

In July 1999, the Pollutant Release and Transfer Register (PRTR) Law was enacted in Japan, and in fiscal 2002, the emissions reporting system of the PRTR Law was implemented. Under this system, manufacturers that handle chemical substances are required to report the amounts of chemicals that they emit and transfer, and to remain committed to voluntary efforts to reduce emissions.

## ●● Commitment to Reducing Chemical Emissions

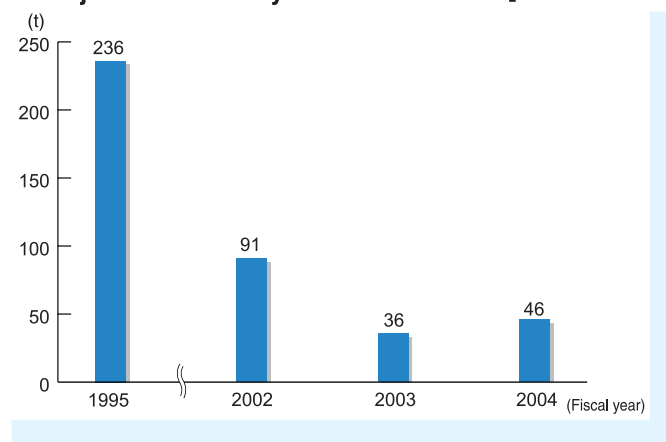
Since fiscal 1995, as part of the Responsible Care activities, Sumitomo Seika has been voluntarily investigating the amounts of chemical substances that it has released and transferred. In particular, the company has been systematically reducing the emissions of 12 chemicals that the chemical industry is seeking to phase out. This effort has entailed improvements to manufacturing processes, substitution with alternative solvents, more thorough chemical recovery, and complete sealing of tanks. As a result, the use of certain chemical substances subject to PRTR was reduced; therefore, the system will be changed so that

## ●● Substances Subject to Voluntary Emission Control

The Central Environment Council of the Ministry of the Environment has identified 22 chemical substances on its list of priority substances as posing a particular human health hazard. Sumitomo Seika handles nine of the twelve chemical substances that have been voluntarily identified for special control measures by the chemical industry as priority hazardous air pollutants. In addition to having developed emissions reduction plans targeting the substances identified for voluntary reductions subject to the PRTR initiative, we have been taking steps to reduce the release of these substances into the atmosphere.

In fiscal 2003, we banned the use of acrylonitrile, and the emissions reduction measures that we had implemented for 1,2-dichloroethane, trichloroethylene, and ethylene oxide proved to be effective. In fiscal 2004, our increased production volume resulted in increased emissions of dichloromethane and trichloroethylene. We intend to continue addressing technical approaches that will enable us to further reduce emissions of these substances in the future.

### [ Emissions of Hazardous Air Pollutants that Are Subject to Voluntary Reduction Plans ]



Some of the fiscal 1995 emissions used are approximate values.

each company promotes its own response rather than follow the industry's reduction plan initiative.

We succeeded in reducing emissions beyond the primary and second reduction plans of the chemical industry. However, we have noticed a trend toward a slight increase in emissions of some substances because of increased production and for other reasons. In response, we will renew our efforts and establish a revised reduction plan in line with government ordinance for controlling VOCs.



Exhaust gas pollutant removal equipment

### [ Major Reduction Measures to the Present ]

- [1] Trichloroethylene : Enhancement of condensing-cooling recovery facility, extension of distillation time (1998, 2000, 2002)
- [2] Dichloromethane : Adoption of alternative solvents for certain products (1998, 2002, 2003)
- [3] 1,2-dichloroethane : Enhancement of recovery facility (1996, 1999, 2002)
- [4] Formaldehyde : Installation of equalization piping (1998, 2000)
- [5] Benzene : Disposal by incineration after modification of the exhaust gas line (2001)
- [6] Ethylene oxide : New charging scheme, installation of simple pollutant removal equipment (2001, 2003)
- [7] Acrylonitrile : Total ban on use (2003)
- [8] 1,3-butadiene : Execution of exhaust gas disposal by incineration (2003)



### ●● Atmospheric Emissions Reduction Plan

Sumitomo Seika has fulfilled the objectives for the 1st stage reduction plan of the 12 chemical substances specified by the chemical industry (30% reduction relative to 1995 emission levels). For the 2nd stage reduction plan, it was decided that each chemical manufacturer in Japan should specify their atmospheric

emissions for fiscal 2003 based on their fiscal 1999 emissions levels. We have implemented the Stage 2 reduction plan and have achieved most of our goals; however, emissions partially increased in fiscal 2004 due to increased production volume.

Substance	1995 emissions (t)	1999 emissions (t)	2003 emissions (t)	Actual 2004 emissions (t)
Acrylonitrile	9	8.8	2.5	0
Dichloromethane	70	24.8	3.5	11.7
1,2-dichloroethane	72	35.3	11	11.7
Tetrachloroethylene	1	1.2	0.5	0.7
Trichloroethylene	70	18.9	9.7	12.4
Ethylene oxide	4	4.7	3.7	3.2
1,3-butadiene	4	2.8	3.5	4.4
Benzene	4	4.1	0	0
Formaldehyde	3	2	1.9	1.9
<b>Total</b>	<b>237</b>	<b>102.6</b>	<b>36.3</b>	<b>46.0</b>



Gas recovery facility (Himeji Works)

### ●● Sumitomo Seika's Atmospheric Emissions Standards

No emission control or environmental standards have yet been specified for most of the substances that have been categorized as subject to the PRTR Law or as hazardous air pollutants. This is because of the absence of any verified correlation between the amount emitted and the magnitude of the hazard presented by these substances. For this reason, chemical emissions manufacturers are required to reduce the emissions of such substances through voluntary determinations of emissions

standards. Therefore, Sumitomo Seika established voluntary emissions standards by referring to the guidelines of the WHO and the EPA, and has been verifying at regular intervals that the emissions of certain chemical substance do not exceed their control values. In accordance with these standards, we have been strictly controlling the emissions of potentially hazardous chemical substances.

(NOTE) WHO: World Health Organization EPA: U.S. Environmental Protection Agency

### ●● Dioxin Control Measures at Incineration Facilities

Sumitomo Seika's waste-liquid incineration facility at the Befu Works belongs in the small-scale incinerator furnace category. In compliance with the Law Concerning Special Measures against Dioxins and the Waste Management and Public Cleansing Law, we have been measuring dioxin concentrations in the atmosphere,

water and the working environment. The measurements in fiscal 2004 were 10% or less than the fiscal 2002 control values. Furthermore, the small-scale incinerators for burning refuse at our Befu, Himeji and Chiba Works are either currently inactive or have been decommissioned.

### ●● PRTR Law Reporting

The PRTR Law specifies 354 substances and stipulates that manufacturers must report to the authorities the status of these substances. Starting with these, Sumitomo Seika has been monitoring 480 substances, including those specified by the Japan Chemical Industry Association (JCIA) for voluntary survey. For fiscal 2005, the number of substances that we had to report in compliance with the PRTR Law was 35. Sumitomo Seika released more than one ton per year of 13 of these substances into the environment. (Befu Works: 5 substances, Himeji Works: 7 substances, Chiba Works: 4 substances)

→ The data for ethylene oxide, xylene, etc. has been reported as a sum from all of our works.

### ○ 13 Substances Covered by PRTR

- |                     |                        |
|---------------------|------------------------|
| [1] 1,3-butadiene   | [8] 1,2-dichloroethane |
| [2] Dichloromethane | [9] Formaldehyde       |
| [3] Ethylene oxide  | [10] Toluene           |
| [4] Chloromethane   | [11] Trichloroethylene |
| [5] Xylene          | [12] Ethyl benzene     |
| [6] Acrylic acid    | [13] Methyl cellosolve |
| [7] Ethylene glycol |                        |

## Measures to Reduce Water Pollution Impacts

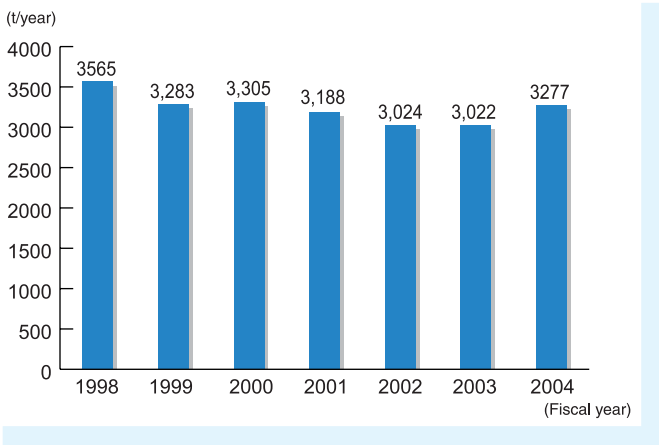
Our Befu Works and Himeji Works are located at the Harima Industrial Area on the Seto Inland Sea. The mechanisms that cause red tide and the eutrophication of this wide stretch of closed water have been investigated. In addition, area-wide total pollutant impact control has been implemented here in order to decrease chemical oxygen demand (COD) and alleviate the overall impacts of pollutants such as nitrogen and phosphorus that adversely affect water quality.

### Pollutant Handling

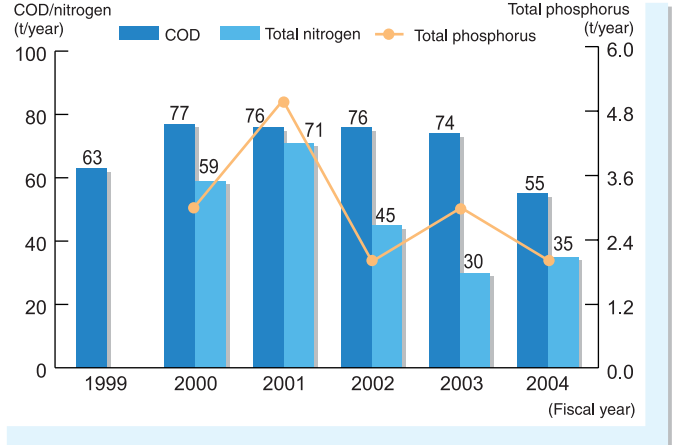
To date, control of total COD has been implemented in five stages, but the environmental standard has not yet been satisfied due in part to the increase in household wastewater. To address this problem, nitrogen and phosphorus pollutants have been added to the fifth control stage as a countermeasure to the eutrophication issue. The government is examining the sixth control stage for total COD and has targeted fiscal 2009 as the completion date. Sumitomo Seika is committed not only to fulfilling these standards in compliance with relevant laws and regulations but also to maintaining the quality of its wastewater through a system

for constantly reporting the measurements of its wastewater to government authorities. Our past record of water resources utilization and change in the COD with our wastewater are summarized below. Control of nitrogen and phosphorus emissions at existing facilities has been effective since 2004. Additionally, we introduced automatic nitrogen and phosphorus analyzers in fiscal 2003 to monitor the concentrations of our nitrogen and phosphorus emissions. We remain committed to controlling the concentrations of the nitrogen and phosphorus pollutants emitted.

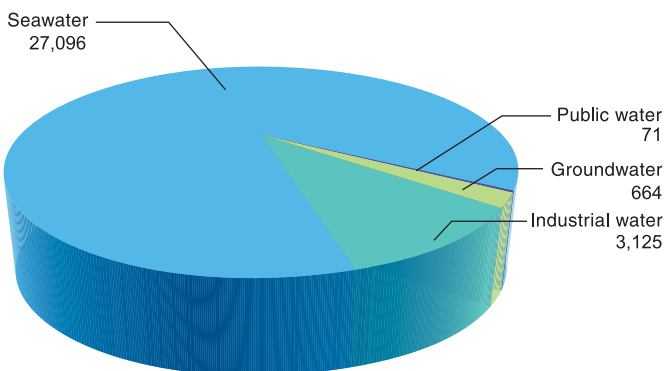
[ Change in Wastewater Amounts ]



[ Change in Water Pollution Impacts ]



[ Water Resources Utilization (t/year) ]



Wastewater treatment facility (Himeji Works)

# Commitment to Chemicals Safety

Chemical substances are indispensable for providing abundance and comfort to modern society. However, certain chemical substances pose danger and can cause harm to people and the environment.

Sumitomo Seika has been making appropriate efforts to assure safety with chemical substances through the activities introduced below.

## Safety Survey on High Production Volume Chemical Substances

At the 1992 Earth Summit held in Rio, Brazil, the proposal was made that the acquisition of safety data for existing chemical substances should be promoted. Then, the Organization for Economic Cooperation and Development (OECD) decided to acquire safety data on chemical substances in use with annual national production levels in excess of 1,000 tons. Sumitomo Seika agreed when the Japan Chemical Industry Association (JCIA) expressed its intention to support this project, and voluntarily promised to acquire the data for seven substances

(sulfolane, hydrogen sulfide, formaldehyde, dimethyl ether, sulfur dioxide, thionyl chloride, and sulfuryl chloride).

In fiscal 2004, we acquired safety data on sulfolane, which was reviewed in Japan. Additionally, the data was submitted to the OECD Initial Assessment Meeting (SIAM 19) where the potential hazards of the substance to environment and human health were assessed. As a result of the assessment, it was determined that sulfolane was not recognized as a hazard requiring urgent measures.

## Quality Assurance

Having acquired ISO 9001 certification, the international standard for quality assurance systems, Sumitomo Seika remains committed to "providing a sense of reliability and satisfaction to our customers" by implementing this quality assurance system in accordance with ISO 9001 guidelines. Furthermore, in manufacturing medical drugs and their intermediates, we follow a comprehensive quality assurance practice that is compliant with the Current Good Manufacturing Practices (CGMP) for medical drug manufacturing and quality control that are specified by the U.S. Food and Drug Administration (FDA).

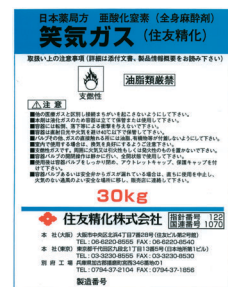
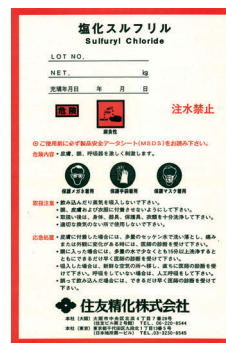
## Warning Labels

In addition to MSDSs, we provide warning labels so that our customers can quickly judge the danger or hazard of Sumitomo Seika products that the customers use.

## Provision of Product Safety Information

Material Safety Data Sheets (MSDS) for chemical substances are documents that describe the characteristics and possible hazards of related substances to prevent possible accidents with the substances. Currently, every chemical manufacturer is required to provide MSDSs in compliance with the PRTR Law, the Industrial Safety and Health Law, and the Poisonous and Deleterious Substances Control Law. Since 1993, Sumitomo Seika has been actively utilizing its MSDSs to provide customers with accurate information on the characteristics of the substances we offer to prevent accidents and disasters.

### [ Warning Label Examples ]



Combustible



Combustion supporting



Poisonous



Corrosive



Wear protective gloves



Wear protective mask



Wear protective goggles

# Safety and Accident Prevention Efforts

Learning from past accidents and disasters, the chemical industry is focused on putting "safety first" and is committed to proactive prevention of accidents and disasters.

## ●● Efforts in the Past Five Years

Beginning in 2003, a number of serious fires and explosions occurred at the workplaces of several well-known Japanese companies. These events prompted the government to request

business enterprises to strengthen and expand their voluntary accident prevention systems in order to prevent a recurrence of these accidents.

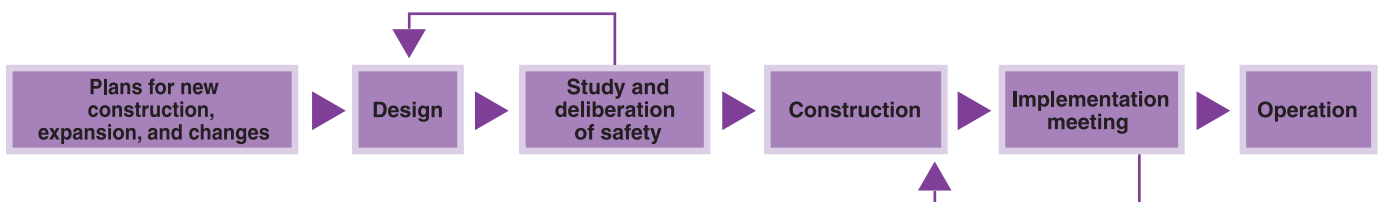
Sumitomo Seika has placed a special focus on the following efforts:

- implementing total safety inspections;
- identifying high-risk operations and drawing up an emergency response manual;
- introducing pre-assessments of facilities and hosting implementation meetings;
- enhancing workplace preparedness by providing thorough explanations.

## Pre-Assessments of Facilities

The following steps show the flow of the effort to assess, reduce, and eliminate hazards before facilities are constructed or altered.

This enables us to allow facilities to begin operation upon the granting of approved by the final implementation meeting.



In fiscal 2004, we introduced HAZOP, the hazard and operability process hazard analysis technique, and provided training that enabled our personnel to acquire this new technique. In fiscal 2005, each works specified its most important existing

facilities and already implemented a safety review. Of course, we will continue to enhance the assessment of both new and existing facilities as well as future renovations.

## Large Squirt Chemical Fire Truck

Our Himeji Works is subject to the Petrochemical Complex Disaster Prevention Act. Because this plant stores massive quantities of hazardous materials and compressed gases, it is required to maintain its own fire truck as part of its voluntary fire-fighting system. Following the enactment of the NOx-PM Law in fiscal 2004, we replaced our conventional chemical fire truck with the latest large squirt chemical fire truck. With its 22-meter extension, this truck has the capacity to spray 3,800 liters of water or 3,400 liters of chemical foam per minute.



Beginning of disaster prevention training



Water spraying drill



Water sprayed from a fire truck

## Commitment to Occupational Safety

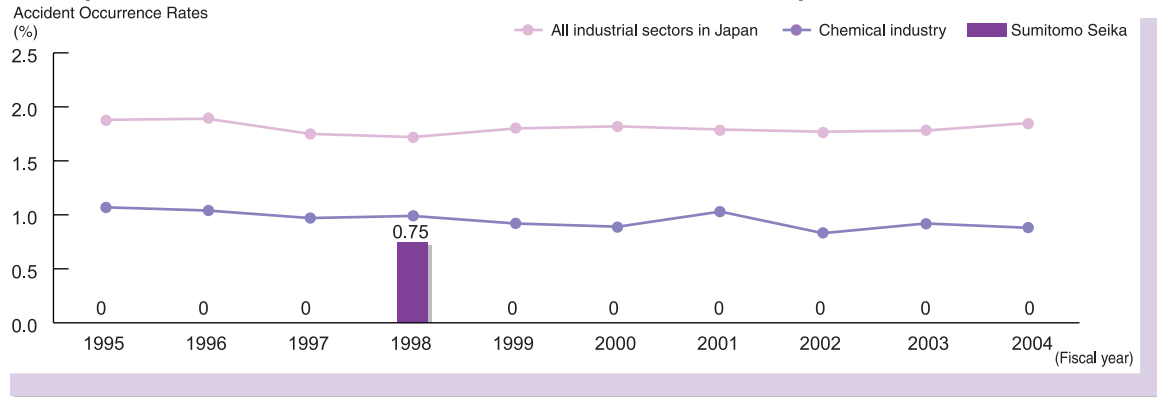
According to statistical data from the Japanese Ministry of Health, Labor and Welfare, the number of job-related accidents resulting from the execution of assigned tasks has been decreasing significantly in recent years. In particular, the number of job-related accidents in the chemical industry in Japan is much lower than the average of all industries.

### ••• Toward Elimination of Accidents and Disasters

In addition to making efforts for security and disaster prevention, Sumitomo Seika, with the goal of elimination of accidents and disasters, has been committed to accident prevention through execution of its annual safety activity plans. Consequently, in the past 14 years beginning with fiscal 1990 only three accidents in our

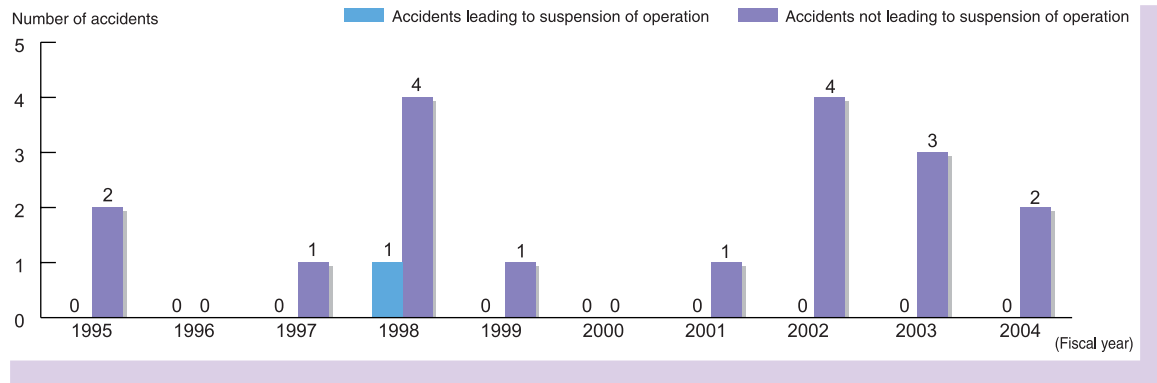
works resulted in temporary suspension of operation. To eliminate accidents including those not leading to suspension of operation, we are further enhancing management guidance and executing routine safety awareness promotion activities, including hazard prediction and potential danger identification.

### [ Comparison of Job-Related Accident Occurrence Rates in Japan ]



Accident occurrence rate = (number of deaths and injuries caused by job-related accidents)/(total work hours) × 1,000,000 hours  
The accident occurrence rate is for accidents that occurred in factories.

### [ Number of Job-Related Accidents (at factories) ]



Life-saving drill



Rescue drill with respiration aid equipped



## Commitment to Logistics Safety

**Safe delivery of products to customers is a critical requirement for chemical manufacturers. An accident during logistics can cause serious trouble for local communities and customers. Therefore, in addition to a commitment to prevention of accidents, chemical manufacturers must also prepare for and conduct drills to respond to emergency situations that might arise.**

### ●● Yellow Cards and Warning Labels

As the number of traffic accidents has increased in recent years, the number of accidents during transportation of chemical substances has also increased.

We hold safety association meetings with our logistics subcontractors and execute safety oversight in our comprehensive safe logistics program.

However, total elimination of traffic accidents would be impossible because of present-day road traffic situations.

In anticipation of the occurrence of a traffic accident during the transportation of chemical substances, each driver transporting our chemical products carries a yellow card that summarizes the logistics safety information about the chemical substances being transported.

Furthermore, a warning label attached to each container identifies the type of substance in the container and the precautions for handling the substance to allow drivers to react quickly to a possible emergency and prevent aggravation of an accident.



Yellow cards that summarize accident countermeasures

### ●● Hazard Assessment for Substances Being Transported

Before transporting our products, we review the hazards that could arise from each chemical substance by referring to the standards of the National Fire Protection Association of the USA. These standards are based on three elements—health hazard, combustion hazard, and instability hazard.

Based on the results of our review, we determine the container construction, the transportation unit amount, the transportation route, and the subcontractor for transportation to assure safety during transportation. In fiscal 2004, we executed hazard reviews for 47 products and transportation method reviews for 36 products.



Tank lorry that incorporates safety features

### ●● Transportation Accident Relief Drills

As a member of the High Pressure Gases Regional Accident Prevention Association, Sumitomo Seika is participating in regional accident relief drills held at its plants to prepare for possible accidents as well as to develop a liaison network in preparation for response to emergency situations.



Transfer from transportation by lorry to safe JR cargo train

## Promotion of Communications with Local Communities

Companies increasingly need to build the support of local communities through communications with them.

Sumitomo Seika is demonstrating its renewed commitment to environmental protection through efforts to promote dialog at community meetings sponsored by the Japan Responsible Care Council (JRCC). Moreover, we hold discussions with local residents and provide explanations of our efforts.

### ●●● Communication Activities with Local Citizens

Our first dialog meeting with local community members was held in 2002, and a second such meeting was held in Himeji in February 2005. We invited members of a residents' association, local government personnel, and representatives of subcontractors to this meeting. As well, we presented details of our commitment to Responsible Care and exchanged opinions with the participants. Our Befu Works holds an annual opinion exchange meeting for the

Pollution Prevention Council sponsored by the Harima-cho government. In addition, the Himeji Works participated in the Himeji Environmental Fair held annually by the Himeji Municipal Government to promote communication with local citizens. Through such activities, we hope to make Sumitomo Seika a company that is loved by the people of the local communities where we have operations.



Community dialog meeting



Community clean-up campaign



Himeji Environmental Fair 2004

### ●●● Responsible Care at Plants in Other Countries

Sumitomo Seika operates two manufacturing affiliates in Singapore and Thailand. While these local operations have adopted Japanese environmental safety technologies, they also place priority on full compliance with local laws and ordinances regarding environmental protection and safety assurance. Notably, to be able to start operation in Singapore, controls stricter than in Japan are mandatory there. More specifically, before starting operation in our Singapore affiliate, it was required to perform safety assessment for its facilities (HAZOP, etc.).

These affiliates have diverse workforces; nonetheless, thanks to the strong emphasis placed on safety assurance at these sites, they have continued to operate without incident since the start of their operations.



Safety meeting (left)  
at Sumitomo Seika Singapore Pte. Ltd. (above)

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Please direct opinions and inquiries to:

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