

TOKYO OHKA KOGYO CO., LTD.

# ENVIRONMENTAL REPORT 2003

**tok** TOKYO OHKA KOGYO CO., LTD.

# 2003 ENVIRONMENTAL REPORT

## CONTENTS

<b>Editorial Policy</b>	<b>1</b>
<b>Scope of Report</b>	<b>2</b>
<b>Notice</b>	<b>2</b>
<b>Our Company</b>	
Message from the President	3
Environmental Policies/Results of the 2002	
Environmental Report Questionnaire	4
Management Philosophy	5
Financial Highlights (Unconsolidated)	6
Network	7
<b>Environmental Preservation Activities</b>	
<b>2002 Environmental Objectives and Achievements</b>	
2002 Environmental Objectives and Goals, and the Results of Activities	9
Environmental Accounting	10
<b>Environmental Management System</b>	
Environmental Management Organization	11
Environmental Awareness and Training	12
Compliance with Legislation and Environmental Regulations	13
Technological Development Aimed at Environmental Preservation and Efforts to Reduce the Impact of Products on the Environment	14
Disclosure of Environmental Information	15
<b>Environmental Performance</b>	
Environmental Impact of Business Operations	17
Reduction in the Input of Energy Resources	17
Promotion of Efforts to Reduce Environmental Impact during Production	18
Efforts Directed at Zero Emissions	19
Management of Chemical Substances	20
<b>Relationships with Society</b>	
Contribution to Local Communities	21
Efforts to Prevent Labor Accidents	22
<b>Collection of Data</b>	
Data on Environmental Impact by Site	23
History of Environmental Preservation Activities	25
Glossary	26



## Activities for Protecting *Miyamakirishima*, a Precious Natural Resource, in Mt. Aso

The attractions of *Miyamakirishima* (a type of rhododendron) include the following: miniaturized tree-shape, often found in alpine plants; its beautiful leaves that harmonize with the color of its flowers; and the elegant, serenely dignified and natural simplicity of the plant itself. We participate in activities to protect this alpine plant which fascinates its viewers with its Japanese beauty.



### Editorial Policy

- At Tokyo Ohka Kogyo, our Environmental Report is published in order to report on our environmental policies as well as our efforts regarding environmental preservation, environmental goals and performance in an easy-to-understand, systematic way.
- Editorial Policy for the 2003 Environmental Report
  - (1)The report presents Tokyo Ohka Kogyo's efforts in developing technologies that have environmental preservation in mind and to reduce the impact of its products on the environment.
  - (2)It also presents the major environment-related topics of fiscal 2002.
  - (3)The scope of data collection has been expanded by adding data from the Sagami Operation Center, as well as the Kumagaya and Shonan Plants. Data presentation has been better organized by publishing data on environmental impact by site.
  - (4)Glossary is included at the end of the report to assist many readers in their understanding of environment-related terms. For terms marked with a star (★), please refer to page 26.
  - (5)The results of the 2002 Environmental Report questionnaire are included in the report, and the opinions obtained from the questionnaire were used to enhance the content of the 2003 Environmental Report.
- In the future, as we have in the past, we would like to receive your valuable opinions and thoughts and will strive to further improve our environmental report and work hard to solve various environmental issues.

### Scope of Report

This report is a summary of Tokyo Ohka Kogyo's environmental preservation activities and their performance during fiscal 2002 from April 1, 2002 to March 31, 2003. Actual data was collected from fiscal 2002, but the report also covers those activities conducted in fiscal 2003.

#### Scope of Data Collection in the Report

- Sagami Operation Center ● Koriyama Plant ● Utsunomiya Plant
- Kumagaya Plant ● Shonan Plant ● Gotemba Plant ● Yamanashi Plant
- Ikuno Plant ● Aso Plant (Please refer to pages 7 and 8.)

#### Materials on Which the Report Is Based

Environmental Reporting Guidelines 2000 published by the Ministry of the Environment

■ This report was published in August 2003, and the next report will be published in August 2004.

■ All inquiries concerning this report should be addressed to:

TOKYO OHKA KOGYO CO.,LTD.  
 Safety Control Section  
 1590 Tabata, Samukawa-machi, Koza-gun, Kanagawa  
 253-0114, JAPAN  
 TEL : +81-467-75-2151  
 FAX : +81-467-75-6551  
<http://www.tok.co.jp/>

### Notice

This document is a translation of the 2003 Environmental Report, published in Japanese in August 2003. Except where noted, facts and figures pertain to activities within Japan during fiscal 2002 from April 1, 2002 to March 31, 2003.

## Message from the President

### Aiming at Environmental Management for Future Generations

The UN Conference on the Environment and Development (Earth Summit) was held in Rio de Janeiro in 1992, and the UN World Summit on Sustainable Development (Rio's Earth Summit +10) took place in Johannesburg in 2002. As exemplified by these events, there has been growing interest in global environmental issues as one of the most important issues common to humankind, and environmental preservation activities have been carried out on a global scale. However, the international community is not addressing environmental issues in complete harmony due to countries' differing opinions concerning the environment. In order to achieve sustainable development in the future, we, the citizens of the earth, are urged to make further, united efforts to tackle environmental issues.

In the industrial world, many of those businesses that typify mass production and mass consumption, which they have practiced repeatedly in the past, have shifted to environmental preservation. In addition, their attitude toward environmental issues has been changing from a passive one of simply fulfilling their social responsibilities to an active one of viewing environmental preservation as one of the important business strategies that may affect their survival in terms of competition.

Under these circumstances, Tokyo Ohka Kogyo considered strengthening the management system for environmental preservation as one of the basic policies in our "TOK Challenge 21" medium-term plan for fiscal 2000 to 2002 and has since made a concerted effort to achieve the goal on a company-wide scale. During the second "TOK Challenge 21" plan, which commenced in the current fiscal 2003, we are also viewing "management methods that take environmental issues into consideration" as one of the prerequisites that give concrete form to our management vision. In the years to come we are determined to work harder than ever to promote environmental management while ensuring a high level of transparency.

Since our foundation in 1940, under our corporate policies that "continue efforts to enhance our technology", "raise the quality levels of our products", "contribute to society", and "promote free-spiritedness", we have contributed to the progress and development of society over a wide range of areas by constantly offering superior products designed to meet market needs. As a member of the chemical industry, however, we need to recognize that in one aspect our products are useful but that in another aspect they may have serious effects on the global environment if we fail to manage them properly. We also need to be aware this potentially negative aspect of our products and take appropriate measures. We assure you that, in the future, based on the full understanding of this, we will continue to make efforts for humankind's development through the creation of new high-level technologies and products. We also assure you that we will continue to act according to the role we should play, with the aim of harmonizing all our corporate activities with nature and society so that we can help achieve sustainable development in the future.

This 2003 Environmental Report is a summary of Tokyo Ohka Kogyo's environmental preservation activities and their performance in fiscal 2002. We hope that as many people as possible will understand our efforts for environmental preservation and that your frank opinions will help raise the quality and effects of our future environmental preservation activities.



*H. Uchida*  
Haruhiko Uchida  
President



### Environmental Policies (Extracts)

In order to help create a recycling-based society, we will work harder than ever to promote work processes and recycling efforts aimed at reducing industrial waste and taking other necessary measures. We will also work hard to have Tokyo Ohka Kogyo recognized by Eco Fund ★ investors as "an active advocate of environmental preservation".

- (1) Envision future business opportunities by promoting recycling
- (2) Use products and materials for as long as possible (prolong their life)
- (3) Minimize the volume of waste generated (reduce emissions)

We will implement these environmental policies by conforming to customer requirements as well as complying with statutory and regulatory requirements, establishing and reviewing goals, continually improving systems and preventing pollution.

March 20, 2003  
TOKYO OHKA KOGYO CO., LTD.  
Department Manager, Manufacturing Dept.  
Toshimasa Nakayama

## Message from the Manager for ISO14001 standards implementation

### Upon the Publication of the 2003 Environmental Report

Global environmental issues conform to no state boundaries. In order to pass on rich natural environments to future generations, it is necessary that all parts of society fulfill their respective functions thus achieving sustainable development in the future.

As a global citizen, we have positioned environmental policies as one of our important business strategies and have been actively engaged in environmental preservation activities.

During the operations of fiscal 2002, we were able to reduce general industrial waste by 18%, as compared to fiscal 2000, and specially controlled industrial waste by 27%, achieving the respective goals set for these two categories. Furthermore, we reduced the impact of our own operations on the environment by decreasing the amount of CO<sub>2</sub> emissions and saving energy through the introduction of cogeneration systems as well as other measures. Meanwhile, we have actively met customer requests such as reducing waste and controlling the volume of chemicals used, by developing and marketing environment-friendly products.

In the future, we will continue our efforts to have the environmental management system more firmly rooted in our operations in order to further reduce environmental impact. This will be achieved through promotion of recycling, prolonged use of products and materials, and reduction in waste material and emissions. To that end, we will set clear targets for each of our plants and operation center, and make a united attempt to push forward with environmental preservation activities.

We will also continue to promote environmental communication with our stakeholders and strive to disclose more environmental information. We would be more than happy if we could hear your frank opinions and thoughts after you have read this report.

### Toshimasa Nakayama

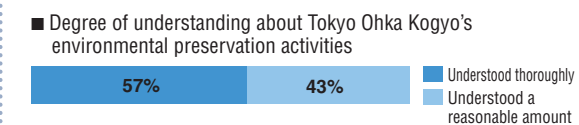
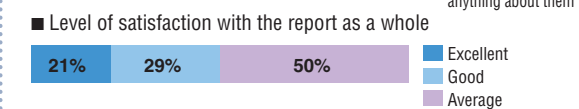
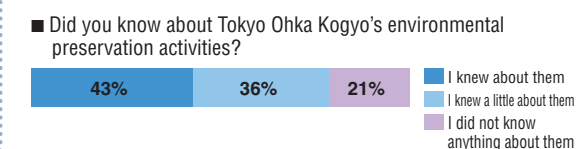
Director & Officer  
Department Manager, Manufacturing Dept.  
Manager for ISO14001 standards implementation



## Results of the 2002 Environmental Report Questionnaire

We have received opinions about, and requests for, the 2002 Environmental Report from many people. We express our gratitude to the readers for their interest in our environmental preservation activities.

This section of the 2003 Environmental Report presents some of the opinions we received as well as our responses to them.



- Some of the opinions received and our responses to them presented in the 2003 report
- I was able to understand because the results were expressed as figures.
  - The management status of resource inputs and outputs was summarized briefly.
  - I think it is important for Tokyo Ohka Kogyo to make any risks involved in its operations public, and explain measures taken for such risks in concrete terms (i.e. figures, how to respond, results, effects, etc.).
  - I think simple terms should be used because descriptions in the report sound a little technical.

▶ In the 2003 report, we tried to use simple terms and expressions and included the Glossary section at the end of the report in order to explain difficult terms.

- With respect to the volume of energy resource inputs, I think it is necessary to show chronological changes in the volume as compared to production unit requirements.

▶ In the 2003 report, we showed unit requirement indexes for the volume of inputs for each energy type and included charts that enabled comparisons of chronological changes over the five-year period to be made.

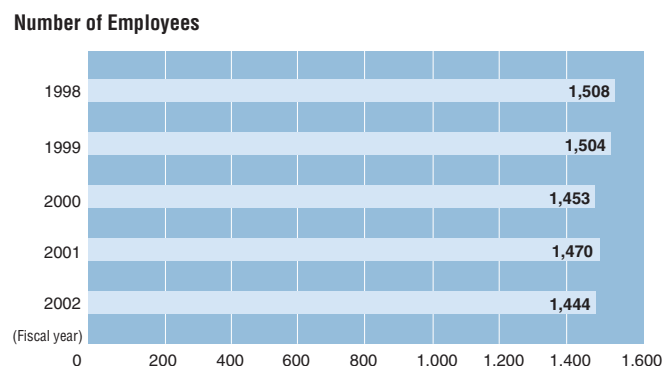
## Management Philosophy

Since our foundation in 1940, under our corporate policies that "continue efforts to enhance our technology", "raise the quality levels of our products", "contribute to society", and "promote free-spiritedness", we have continued to supply photoresists, essential to the semiconductor and flat panel display manufacturing process. During this period, we have been highly rated as the top supplier of photoresists and have played a role in catering to the needs of the leading-edge electronics industry.

In the recent business environment that surrounds us, due to intensifying competition between businesses and accelerating market dynamism, new generations of technologies are emerging at an unprecedented pace and the level of requirement characteristics is increasing rapidly. Under these circumstances, in order to continue to provide valuable products and solutions and win the high confidence of stakeholders and ensure their high level of satisfaction, we will concentrate the managerial resources on the fine processing technologies that have been developed over the years. Thus we are committed to contributing to societal progress and development across a wide range of areas by supplying superior products.

### Corporate Profile (as of March 31, 2003)

- Corporate Name: TOKYO OHKA KOGYO CO., LTD.
- Established : October 25, 1940
- Headquarters : 150 Nakamaruko, Nakahara-ku, Kawasaki, Kanagawa 211-0012, JAPAN
- President : Haruhiko Uchida
- Capitalized : 14,640 million yen
- Employees : 1,444



### Main Operations

The main operations of Tokyo Ohka Kogyo consist of materials manufacturing, which comprises the manufacture of: photoresists, printing materials, chemicals and specialty chemicals, and equipment manufacturing. The latter is centered on the manufacture of semiconductor and LCD panel manufacturing equipment (see page 6).

### Topics for Fiscal 2002

#### Winning the SCQI Award from Intel

We received the 2002 Supplier Continuous Quality Improvement (SCQI) Award from Intel Corporation.

The SCQI Award is a prestigious award that is presented to businesses that supply the best products or services that support development and manufacture at Intel. We were rated highly for the quality and functions of our photoresists and developing solutions used in the semiconductor manufacturing process. At the same time, we were rated favorably for our efforts to reduce environmental impact through reduction in waste material and other measures. In terms of safety, our efforts to assess the safety of newly developed products, establish health and safety policies, operate labor health and safety management systems and take other measures, were also favorably evaluated. We became the first photoresist manufacturer to win the award.



Plaque presented by Intel

#### Construction of a New Research and Development Building



View of the research and development building (Sagami Operation Center)

In recent years, the electronics industry has seen new generations of technologies emerge at an accelerating pace, and users have demanded higher performance levels as well as more complicated products with enhanced functions. In order to respond to these trends, we constructed a new research and development building within the Sagami Operation Center.

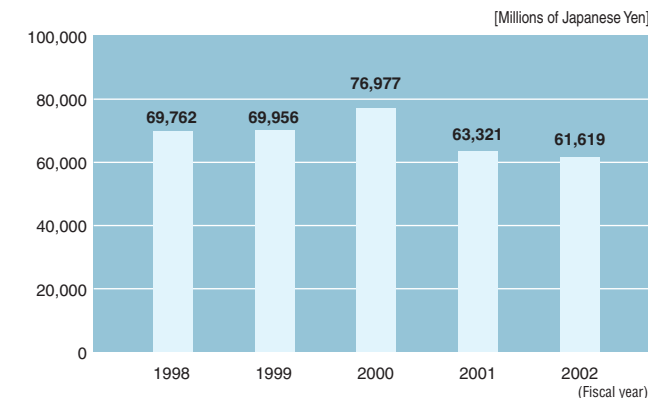
This R&D building has introduced production facilities with deodorization furnaces. It is also a building that gives consideration to the environment; for example, by using natural gas as the boiler fuel smaller amounts of sulfur oxides, the cause of global warming and atmospheric pollution, are generated. In addition, several safety measures are being taken, including making the building fire-resistant and wiring and other facilities explosion proof.

The completion of this R&D building enables us to manufacture prototypes on a medium-lot production scale, substantially shortening the time required to supply products to users. In the future, the R&D building is expected to play a major role in responding swiftly to user needs.

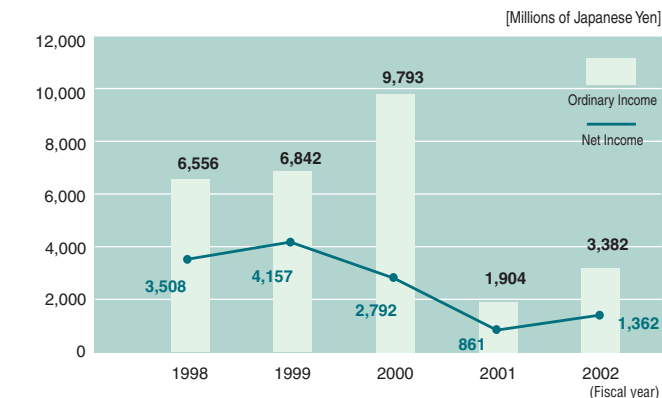
## Financial Highlights (Unconsolidated)

### Business Results

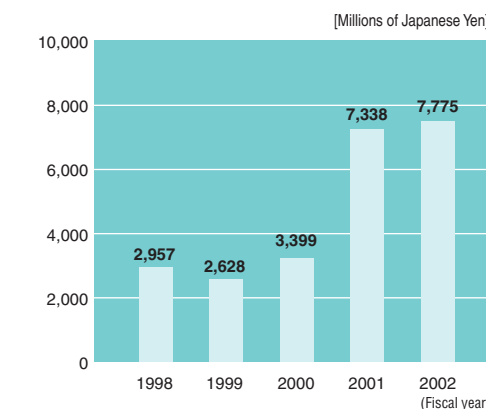
#### Net Sales



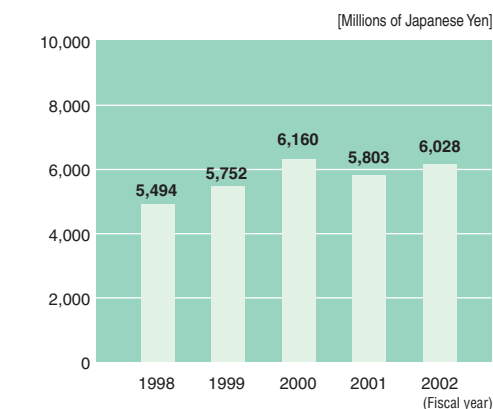
#### Profits



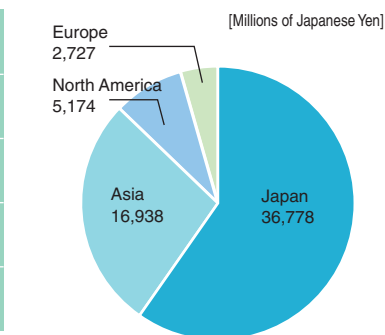
#### Capital Investment



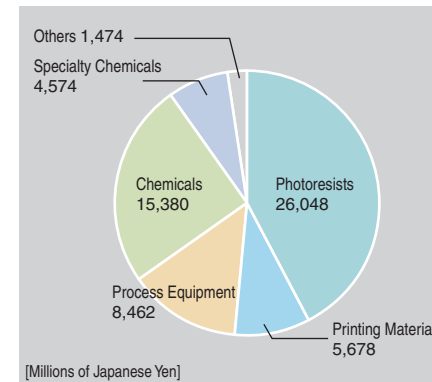
#### R&D Expenditure



#### Net Sales by Geographic Area (Fiscal 2002)



#### Net Sales by Division (Fiscal 2002)



Division	Main Products	Main Use
Photoresists	Photoresist Dry film resist	For semiconductor, printed wiring board, flat panel display and printing/plate making
Printing Materials	Photopolymer plate for printing Materials for offset printing	Plate making materials for newspaper, general and flexographic printing
Process Equipment	Dry etching machine Dry ashing machine Photoresist coater / developer	For semiconductor, printed wiring board, flat panel display and printing/plate making
Chemicals	Photoresist related chemicals Inorganic chemicals Organic chemicals	For semiconductor, printed wiring board, flat panel display, cosmetics, battery, chemicals and food additives
Specialty Chemicals	Spin-on planarization source for interlayer formation	For semiconductor and electronic devices



Photoresists for semiconductor



Photopolymer plates and flexographic printed matters



Dry ashing machine

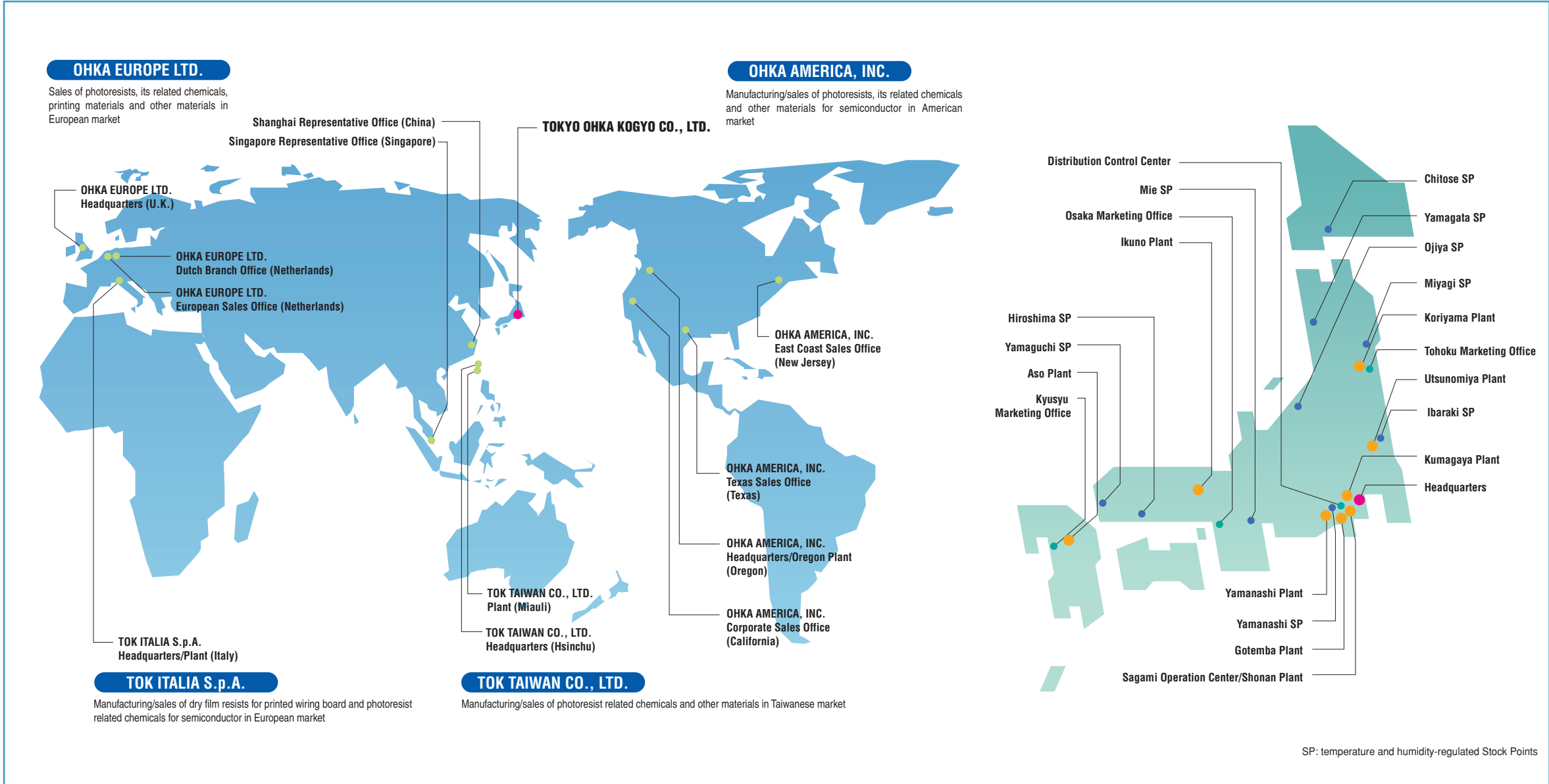


Photoresist related chemicals



Specialty chemicals

## Network (as of August, 2003)



Sagami Operation Center



Koriyama Plant



Utsunomiya Plant



Kumagaya Plant



Shonan Plant



Gotemba Plant



Yamanashi Plant



Ikuno Plant



Aso Plant

## Contact for Each Site and Major Product Items

Site	Address	TEL	Major Product Items
Headquarters	150 Nakamaruko, Nakahara-ku, Kawasaki, Kanagawa 211-0012, Japan	+81-44-435-3000	
Sagami Operation Center	1590 Tabata, Samukawa-machi, Koza-gun, Kanagawa 253-0114, Japan	+81-467-75-2151	Photoresists, photoresist related chemicals, organic chemicals
Koriyama Plant	1-23 Machiikedai, Koriyama-shi, Fukushima 963-0215, Japan	+81-24-959-6911	Photoresists, dry film resists, photoresist related chemicals
Utsunomiya Plant	21-5 Kiyohara Kogyo Danchi, Utsunomiya-shi, Tochigi 321-3231, Japan	+81-28-667-3711	Photoresists
Kumagaya Plant	823-8 Kamibayashi, Miizugahara, Kumagaya-shi, Saitama 360-0844, Japan	+81-48-533-1171	Chemicals for CRTs, inorganic and organic chemicals
Shonan Plant	7-8-16 Ichinomiya, Samukawa-machi, Koza-gun, Kanagawa 253-0111, Japan	+81-467-74-2125	Dry etching machine, dry ashing machine, photoresist coater/developer
Gotemba Plant	1-1 Komakado, Gotemba-shi, Shizuoka 412-0038, Japan	+81-550-87-3003	Photoresists, spin-on planarization source for interlayer formation
Yamanashi Plant	10234 Shimoyama, Minobu-cho, Minami Koma-gun, Yamanashi 409-2522, Japan	+81-5566-2-3151	Photopolymer plates for printing/molding, materials for offset printing
Ikuno Plant	373-70 Mayumi Dojun-yama, Ikuno-cho, Asako-gun, Hyogo 679-3311, Japan	+81-79-679-2611	Dry film resists, photoresist related chemicals
Aso Plant	4454-1 Miyaji, Ichinomiya-machi, Aso-gun, Kumamoto 869-2612, Japan	+81-967-22-4411	Photoresists, photoresist related chemicals



Headquarters

Eco Ice, the environment-friendly air-conditioning system, has been introduced.

# 2002 Environmental Objectives and Achievements

## 2002 Environmental Objectives and Goals, and the Results of Activities

We had "promoting cost reduction efforts" as an environmental objective for fiscal 2002. Based on this objective, each site set two items such as reducing general industrial waste and reducing specially controlled industrial waste as environmental objectives. Each site also established six-step environmental management activities, which included an expanded application of the ISO14001 standards. Thus we have worked hard to achieve these objectives and fulfill our commitment to society.

We adopted cost reduction efforts as an environmental objective as we were convinced that harmonizing ecology with economy would reduce the environmental impact. We also believed that referring to the latent benefits of preventing pollution, as defined in the ISO14001 standards, reducing the harmful effects on the environment and improving efficiency, would also result in cost reductions.

Evaluation level: 😊 Goal achieved 🟡 Goal achieved by 75% or more 😞 Goal achieved by less than 75%

Item	Tasks	Goals for fiscal 2010	Medium-term plan for fiscal 2005	Action plans for fiscal 2002	Results of activities in fiscal 2002	Evaluations in fiscal 2002	Related information
Environmental Objectives	Reducing general industrial waste	30% decrease with the fiscal 2000 level at 100% Applied to: Six ISO certified plants	25% decrease with the fiscal 2000 level at 100% Applied to: Six ISO certified plants	10% decrease	Reduced by 18%	😊	P17 P19
	Reducing specially controlled industrial waste	35% decrease with the fiscal 2000 level at 100% Applied to: Six ISO certified plants	30% decrease with the fiscal 2000 level at 100% Applied to: Six ISO certified plants	15% decrease	Reduced by 27%	😊	P17 P19

Item	Tasks	Action plans for fiscal 2002	Results of activities in fiscal 2002	Evaluations in fiscal 2002	Related information	
Environmental Management Activities	Expanding the application of the ISO14001 standards	Implementation on a company-wide scale	Commencing activities for obtaining ISO14001 certification at sites that have not yet acquired such certification	Kick-off in November of efforts to acquire certification in fiscal 2003	😊	P11 P12
	Environmental accounting	Expanding the scope of application for the system	Expanding the scope of application to the entire company	Already implemented in all manufacturing plants and operation center Environmental preservation costs: ¥397 million	🟡	P10
	Environmental capital investments	Promoting capital investments with the emphasis placed on environmental concerns	Installing deodorization facilities (Aso Plant) Introducing facilities that consider the environment (Sagami Operation Center)	Installing deodorization facilities (Aso Plant) Introducing facilities that consider the environment (Sagami Operation Center) Investments: ¥88 million	😊	P5 P10 P15
	Establishing the PRTR system	Expanding an application range of chemical substances	Selecting independently controlled substances to apply the PRTR system to a wider range of substances	Applying the PRTR system to a wider range of chemical substances and starting the operation of the system	😊	P20
	Information disclosure	Active information disclosure	Publishing an environmental report	The 2002 Environmental Report was published in October 2002.	😊	P15
	Cooperating with local communities	Participating in local events	Encouraging several plants to participate in local events	Four plants and one operation center participated in local events.	😞	P21

## Environmental Accounting\*

Environmental accounting aims to achieve greater efficiency in, and promoting of continuous improvements in, environmental investments and environmental activities. It consists of "environmental conservation costs" and "environmental conservation effects", both of which are indicators for evaluating environmental activities in quantitative terms. The statements of environmental accounting shown below have been prepared in accordance with the Environmental Accounting Guidelines 2002 published by the Ministry of the Environment in 2002.

Scope of data collection: All manufacturing plants and operation center in Japan  
Accounting period: April 1, 2002 to March 31, 2003

[Millions of Japanese Yen]

Environmental conservation cost				
Category	Key activity and the outcome	Investment	Costs	
(1) Business area cost		88	339	
Breakdown	(1)-1 Pollution prevention costs	Operating and maintenance of wastewater treatment facilities, private sewage treatment tanks and deodorization furnaces	88	135
	(1)-2 Global environmental conservation cost	Repairing steam piping	0	1
	(1)-3 Resource circulation cost	Disposing of waste material	0	203
(2) Upstream/downstream cost	Collecting containers and packaging materials	0	4	
(3) Administration cost	Monitoring, measurement and other activities	0	45	
(4) R&D cost	Developing equipment for reducing environmental impact	0	6	
(5) Social activity cost	Cleaning inside and outside the plant	0	3	
(6) Environmental remediation cost		0	0	
<b>Total</b>		<b>88</b>	<b>397</b>	

Item	Descriptions	Amount	Related information
Total investment in current period	Installing deodorization equipment (Aso Plant) and introduction of environment-friendly facilities (Sagami Operation Center)	88	P5 - P15
Total R&D cost in current period		6	P14

Environmental conservation benefit				
Descriptions of benefit	Category	Indicator		Related information
		Value for indicator		
(1) Benefit corresponding to business area cost	Benefit associated with the inputs of resources into business operations	Volume of electric power	Unit requirement index Reduced by 1% as compared to the previous year	P17 P18
	Benefit associated with environmental impact and waste emissions from business operations	General industrial waste Specially controlled industrial waste	Reduced by 18% as compared to fiscal 2000 Reduced by 27% as compared to fiscal 2000	P17 P19
	Others	—	—	—
(2) Benefit corresponding to upstream/downstream cost	Benefit associated with the goods and services produced by business operations	—	—	—
	Others	—	—	—
(3) Other environmental conservation benefit	Benefit associated with transports and other operations	—	—	—
	Others	—	—	—

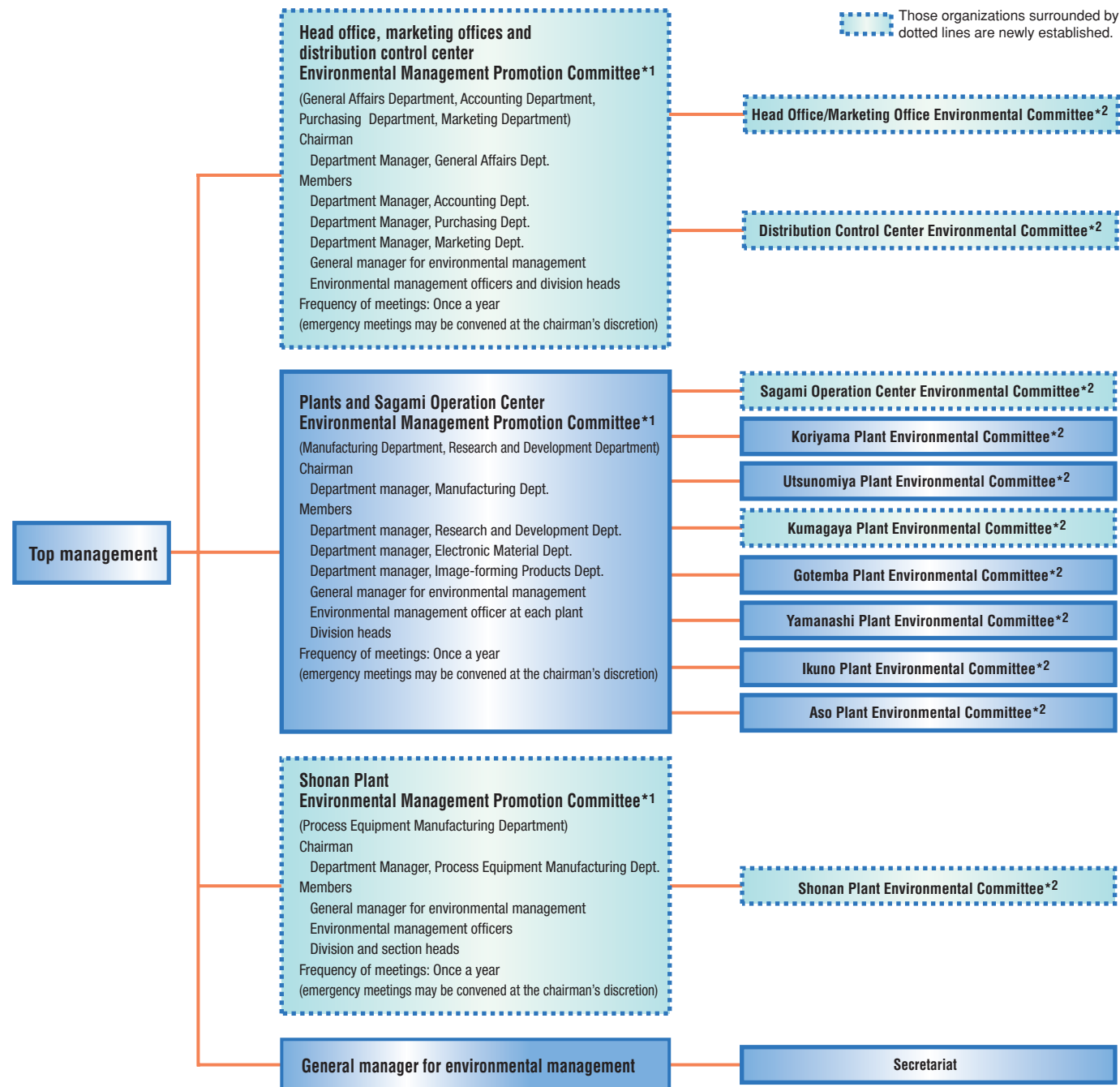
Economic benefit associated with environmental conservation activities - actual benefit -		
Descriptions of benefit	Amount	
Revenue	Income by the recycling of waste generated by key business operations	5
	Operating revenue by recycling of used product	7
Expense saving	Reducing energy costs through power saving	17
	Reducing waste disposal costs through resource saving and recycling	8
<b>Total</b>		<b>37</b>

Chronological changes			
Classification \ Fiscal year	Fiscal 2000	Fiscal 2001	Fiscal 2002
Environmental conservation expenses	495	357	397
Environmental conservation investments	6	45	88
Value of economic benefit arising from environmental conservation activities	68	212	37

# Environmental Management System

## Environmental Management Organization

Three Environmental Management Promotion Committees\*1 were set up so that each organization within the company could take the lead in promoting environmental management policies and measures and conducting environmental preservation activities effectively. Under these committees, the Environmental Committees for the respective sites participated in environmental preservation activities to establish a company-wide system that involves all employees. Thus an environmental management system was introduced in order to contribute to the creation of a recycling-based society★ while incorporating environmental preservation activities into all aspects of business operations.



### \*1 Responsibilities of the Environmental Management Promotion Committees

- To set environmental objectives
- To confirm, discuss and review activities conducted by each site
- To report results to top management

### \*2 Environmental Committees

Chairman: Environmental Management Officer at each site  
 Members: Section heads and environmental officers  
 Frequency of meetings: Once a month (convened at the chairman's discretion)

#### Major activities

- Discussing methods for operating and maintaining the environmental management system at each site, as well as its modifications and the status of its operation
- Setting environmental objectives for each site and environmental goals for each section and developing implementation plans for each site and section
- Examining the progress made in achieving the environmental objectives and goals, as well as the final results of environmental preservation activities of each site and section, and reporting to the Environmental Management Promotion Committee
- Confirming the status of operation of the environmental management system for each section
- Promoting information exchange within each site and with other sites

## Operation Methods

Based on the environmental policies and objectives, we have established the PDCA cycle in which we work out plans for achieving the objectives and goals (Plan), implement and enforce the plans (Do), examine and correct the results of implementation and enforcement (Check) and review the objectives and goals for next steps (Action). Through this cycle, we are working hard to improve the environmental management system on a continuous basis and reduce the harmful impact of our operations on the environment.

## Acquisition of ISO14001 Certification

In order to independently and continually take environmental preservation measures, including responding swiftly to environmental issues and avoiding environmental risks in advance, we have, since fiscal 1998, made efforts to acquire ISO14001★ certification. To date, approximately 70% of our manufacturing sites have obtained ISO14001 certification. Those manufacturing sites that have already obtained such certification have undergone triennial renewal audits.

Site	Head-quarters	Sagami Operation Center	Koriyama Plant	Utsunomiya Plant	Kumagaya Plant	Shonan Plant	Gotemba Plant	Yamanashi Plant	Ikuno Plant	Aso Plant
Date of ISO certification	-	-	November 1999	November 1999	-	-	November 1999	November 2001	November 2000	November 2000



ISO registration certificate

## Environmental Audits

Environmental audits★ are carried out regularly to assess whether the environmental management system is operated and maintained appropriately. In fiscal 2002, environmental audits were performed by external organizations at six plants that had acquired ISO14001 certification. Renewal registration for these sites was completed. In addition, internal auditors conduct internal audits at each site, and the results at one site are circulated to the other sites to further raise the level of environmental management systems and promote the sharing of information on effective operation methods.



## Environmental Awareness and Training

Environmental awareness and training were provided to enable all employees to deepen their knowledge of environmental affairs and act by taking possible environmental impacts into consideration for all aspects of the company's operations.

In the current fiscal year, after audits for renewal by ISO auditing and registration organizations in November were completed, two plants, one operation center, one distribution control center, the head office and three marketing offices were included within the scope of the environmental management system application. At each of these recently added sites, carefully considered educational programs aimed at creating a greater awareness of environmental affairs among the employees, were implemented by personnel responsible for education at the company's ISO Office. These were achieved using *Zu de Miru Kankyo Hakusho* (Graphic White Paper on the Quality of the Environment), ISO14001 standards, environmental manuals and other materials.



## Major Environmental Education Programs at Each Site

Eight plants and one operation center implement their own environmental programs by taking into consideration the condition of their respective sites.

### Publication of the newsletter from the biotope *Komakado Tonbo Ike Tsushin* (Komakado Dragonfly Pond News)

This biotope★, created in 2001, was named the Komakado Tonbo Ike (dragonfly pond). *Komakado Tonbo Ike Tsushin* is published every month. Copies are distributed to employees to enable them to recognize the importance of nature through this biotope and raise the employees' awareness of the need for environmental protection.



Biotope "Komakado Tonbo Ike"



Copies of *Komakado Tonbo Ike Tsushin*

### Survey of the degree of infiltration in terms of environmental awareness

Carefully thought-out education programs are implemented to ensure that all employees firmly understand the environmental management system and perform their duties based on this understanding. One example is to ask the employees questions about environmental preservation activities conducted at the site in the format of an examination and provide them with further education dependent on the marks they receive.

## Drills for Responding to Environmental Accidents and Emergencies

During fiscal 2002, there were no accidents or other events that had an adverse effect on the environment outside of the company.

### Major drills at each site

- Drills for preventing the spread of solvents widely used at chemical plants were carried out on the assumption that an accident involving the leak of such solvents had occurred. Specifically, in order to enable appropriate response to unforeseen accidents, drills for taking measures when chemical fluids leaked were conducted at seven plants and one operation center.
- As part of the company's security and disaster prevention activities, initial fire fighting drills were executed at all sites.



## Compliance with Legislation and Environmental Regulations

With respect to our existing products, we carry out many-sided evaluations necessary to ensure their safety. These evaluations includes safety tests that are suited to applications and toxicity tests based on the Law Concerning the Examination and Regulation of Manufacture, etc. of Chemical Substances as well as the Industrial Safety and Health Law. We also apply, as necessary for the registration of new chemical substances with the appropriate authorities with the aim of establishing a system for complying with domestic and international laws and regulations, as well as those in the countries with which we are concerned.

At each site, environmental laws and orders, ordinances, agreements, information on substances that customers require us to control and other requirements are organized into the List of Statutory and Other Requirements. This is intended to ensure that what the employees must comply with and practice is clear. The Monitoring and Measurements List has been created to formalize the monitoring and measurements that should be performed regularly, as well as those that should be conducted at prescribed intervals in order to confirm the status of compliance. The Monitoring and Measurements List is based on the List of Statutory and Other Requirements.

Environment-related laws and regulations	Sagami Operation Center	Koriyama Plant	Utsunomiya Plant	Kumagaya Plant	Shonan Plant	Gotemba Plant	Yamanashi Plant	Ikuno Plant	Aso Plant	
Air Pollution Control Law	○	○	○	×	×	○	○	○	○	○
Water Pollution Control Law	○	○	○	○	○	○	×	○	○	○
Sewerage Law	○	×	×	○	○	×	×	×	×	×
Noise Regulation Law	×	○	○	×	×	○	×	○	○	○
Vibration Regulation Law	×	×	○	×	×	○	×	○	○	×
Offensive Odor Control Law	○	○	○	×	×	○	○	○	○	○
Soil pollution	×	×	×	×	×	×	×	×	×	×
Ground subsidence	×	×	×	×	×	×	×	×	×	×
Waste material	○	○	○	○	○	○	○	○	○	○
Energy conservation	○	○	×	×	×	×	○	×	×	×
PRTR	○	○	○	○	×	○	○	○	○	○

○ Applicable  
× Not applicable

Monitoring and measurements are carried out to evaluate environmental performance★ with respect to the air, water quality, noise, vibration and soil. The results of measurements for environmental performance in fiscal 2002 indicated that at one location in the Aso Plant, noise measurements exceeded the maximum permissible value, but the facilities concerned were swiftly improved and as a result, the noise level was lowered to come below the maximum permissible value. With respect to other measurement items, environmental performance was maintained at satisfactory levels at all sites. We have not been punished with major or minor fines for violations of environmental regulations, and there were no disputes in which we started or faced a lawsuit.

## Management of Parts That Contain PCBs

Effective from July 2001, the Law concerning Special Measure against PCB★ Waste required manufacturers to report the status of waste PCB storage to the authorities. Subsequently, it was planned that waste PCB will be discarded in accordance with the basic waste PCB disposal plans, which were published by the Ministry of the Environment in April 2003.

We possess parts of end-of-life facilities that contain PCB at Sagami Operation Center and notify the Kanagawa prefectural government of such possession in compliance with the relevant laws and regulations. These parts are currently stored in dedicated containers for which measures are taken to prevent oil from leaking out and are placed under strict control. In the future, we plan to dispose of them appropriately according to the plans formulated by the Ministry of the Environment.

## Measures for Ozone-depleting Substances

At Tokyo Ohka Kogyo, specified chlorofluorocarbons (CFC), such as CFC-11 and CFC-12, which have strong ozone-depleting effects, are used chiefly as refrigerator and freezer coolants. The conditions associated with the use of CFC, however, are clearly understood and these substances are placed under strict controls in order that they are treated and disposed of properly in accordance with the relevant laws and regulations.

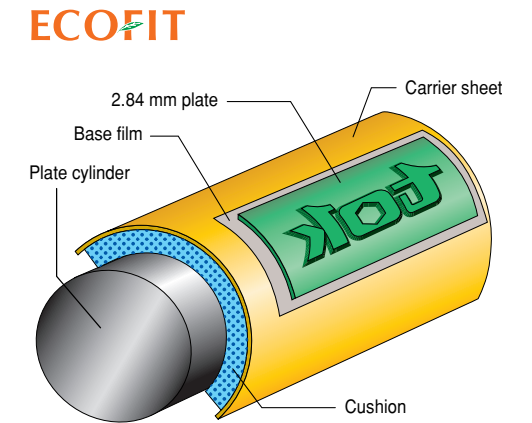


## Technological Development Aimed at Environmental Preservation and Efforts to Reduce the Impact of Products on the Environment

### ECOFIT System

The ECOFIT is a new system of corrugated cardboard printing, and its name is derived from a combination of "ECO" for ecology and "FIT" for fitness. Previously, 7 mm photopolymer plates were used for flexography, but we developed and marketed the ECOFIT, which combines the 2.84 mm Elason® N Series photopolymer plate with a magnetic cushion, in order to consider the environment and meet fine printing needs.

The magnet allows the cushion to be removed for recycling. If it is removed, a 7 mm photopolymer plate can also be used. Furthermore, if a thin (2.84 mm) photopolymer plate is used it makes it possible to improve the reproducibility of dots, thin lines and other fine shapes as compared to the conventional 7 mm plate. Using the thinner plate also reduces the volume of waste material generated during plate making and after printing significantly.



### "Spinless™"

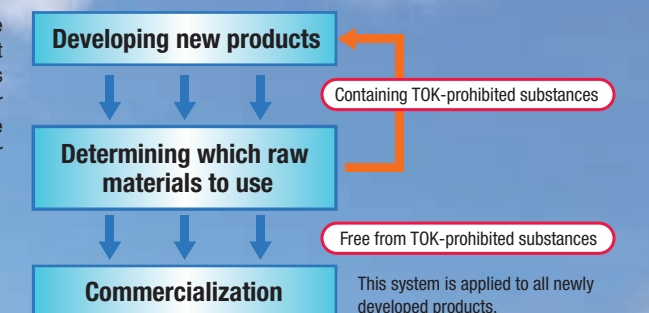
In the past, when a photoresist (photosensitive resin) coating was applied to the LCD glass substrate, the method used involved the glass substrate, on which photoresist had been dropped, being rotated at high speed in order to spread a uniform film of photoresist over the substrate by centrifugal force. In this method, however, an unnecessary amount of photoresist was scattered, causing material to be wasted. By contrast, Tokyo Ohka Kogyo's new coating technology, "Spinless", does not use spin coating but applies a coating of photoresist to the glass substrate by making the nozzle scan the substrate. As a result, only the amount of photoresist needed can be applied to the substrate, thus reducing wastage substantially. When "Spinless" applies a coating of photoresist to a fifth-generation LCD glass substrate 1,100 mm by 1,250 mm, it can reduce the amount of photoresist used by 60% or more when compared to the conventional device. This technique also cuts down the amount of cleaning or rinsing solutions and other substances used by up to 90%. This breakthrough technology achieves reductions in terms of both environmental impact and cost.



## Advanced Assessment System for Raw Materials Used to Develop New Products (Management of Hazardous Chemical Substances)

In accordance with related laws and regulations in various countries and based on the hazard rankings announced by research institutes and other organizations, we have created our own TOK List of Prohibited Substances for harmful substances that are carcinogenic, mutagenic and toxic to the reproductive system. Based on this list, we have put in place a system that enables us to assess the chemical substances contained in raw materials used for newly developed products during the design process as well as later stages and have implemented the system independently. By doing so, we are striving to preserve the environment and ensure the health and safety of our products' users.

### Conceptual Chart of the Advanced Assessment System for Raw Materials Used



## Disclosure of Environmental Information

We believe that the accurate and active communication of information on our environmental policies and environmental preservation activities to our stakeholders will lead to an enhancement of our future environmental activities.

### ■ Publishing Environmental Reports

As a medium and tool for disclosing environmental information, we started to publish an Environmental Report in fiscal 2002. The Environmental Report includes a faxable questionnaire in order to promote two-way communication with readers. In order to have its readers better understand Tokyo Ohka Kogyo's efforts for environmental preservation, the 2003 Environmental Report carries detailed information, including environmental activities from each site. In the future, we will continue to publish Environmental Reports periodically.



### ■ Publishing Environmental Reports on the Website

Starting with the recently issued 2003 Environmental Report, our Environmental Reports are available on Tokyo Ohka Kogyo's website as well.

<http://www.tok.co.jp/>

### ■ Investor Relations Facilities Tours (Koriyama Plant)

As part of our investor relations programs, we organized, in September 2002, a tour of the recently built PDP dry film resist production facilities at our Koriyama Plant. This tour was mainly for institutional investors. A total of 33 people participated in the two-day tour, and a briefing was given to explain the progress in the research and development of our products. Presentations were also made on the plant and its production facilities.



Participants touring Koriyama Plant

In order to enable many of our stakeholders to understand our environmental preservation efforts, we organize a regular tour of our facilities for market watchers.

## Stakeholders' Requests and Our Response

### ■ Installing Deodorization Equipment (Aso Plant)

In fiscal 2001, residents in the neighborhood of the Aso Plant reported that offensive smells were being emitted when photoresist was being produced. In fiscal 2002, in response to this information, we made improvements, including installing deodorization equipment aimed at reducing the offensive smells emitted from the plant. As a result, we were able to significantly reduce the concentration of gas emitted as compared to the period prior to installation.



External view of the deodorization equipment installed at the Aso Plant

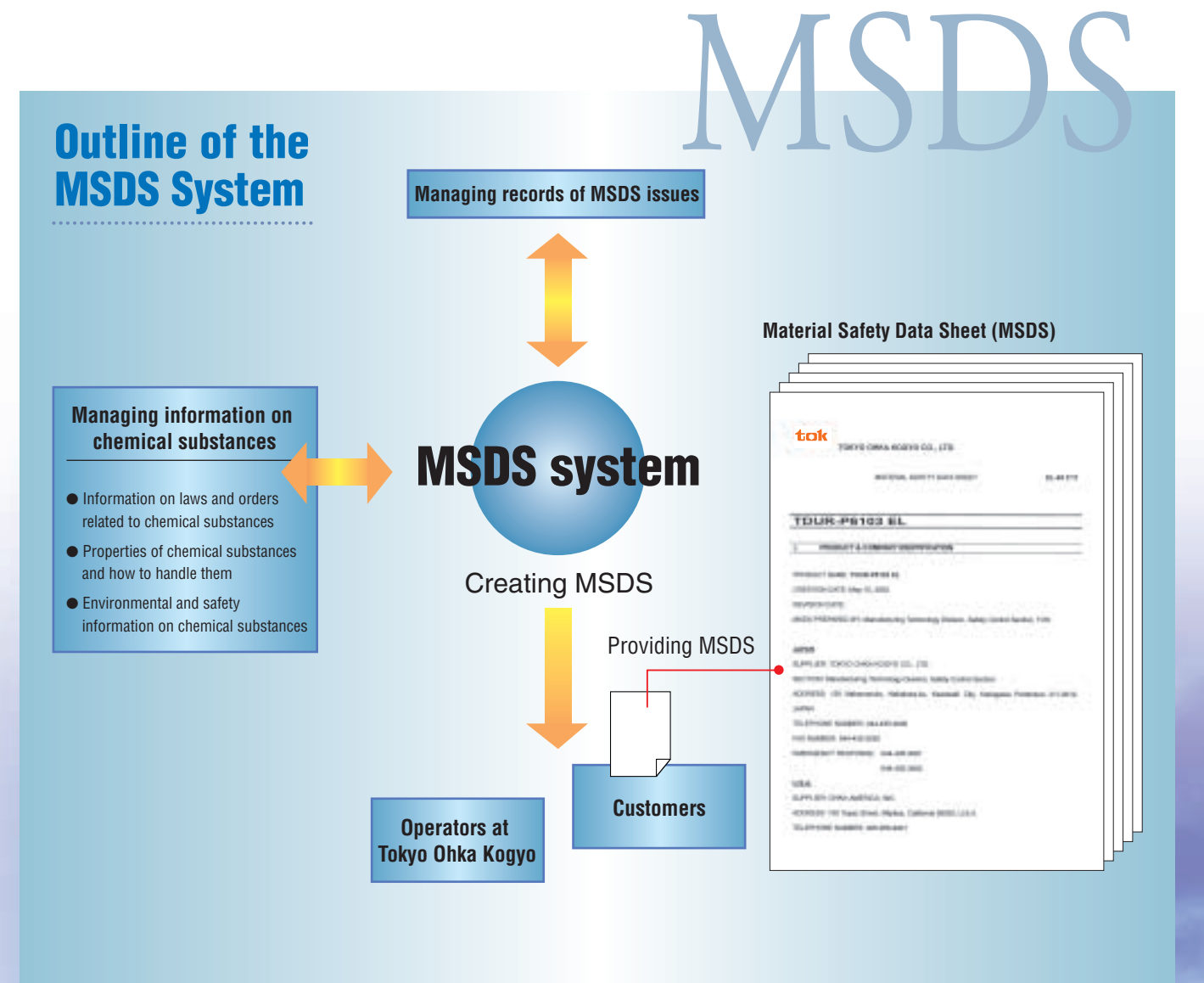
### ■ Establishing a System for Meeting Customer Requirements Regarding Substances with Environmental Impact

In recent years, the electric and electronic parts industries centered on semiconductors have been subjected to strict regulations in various countries regarding substances that have an environmental impact. Against this backdrop, those manufacturers of photoresists used to produce semiconductors, flat panel displays and printed wiring boards are also urged in order to reduce environmental impact and comply with environmental regulations, to provide products that do not contain specified chemical substances. We convey customer requirements for the reduction of substances with environmental impact to the relevant business units as well as other concerned parties and also endeavor to establish a product development system that reflects such requirements.

## Providing Environmental and Safety Information on Products

With respect not only to hazardous substances but also all products and prototypes, we create Material Safety Data Sheets (MSDS★) in an electronic format that contains information on the various substances' properties and ways of handling them, as well as environmental and safety information. We also have in place a system for creating and managing information on chemical substances that we use, as well as a means of managing records of MSDS issues. By doing so, we are striving to be able to provide accurate MSDSs swiftly to our customers as well as operators at our worksites.

All of the currently issued MSDSs are based on the JIS Z 7250★ standard. They also comply with the PRTR Law, the Industrial Safety and Health Law and the Poisonous and Deleterious Substances Control Law.



## Providing Environmental and Safety Information during Product Transport

As a way of avoiding damage to people, goods and the environment due to leakages, fires, explosions and other accidents that may occur while hazardous substances are transported, we require that, while on duty, our drivers carry emergency contact cards (yellow cards) with them at all times.

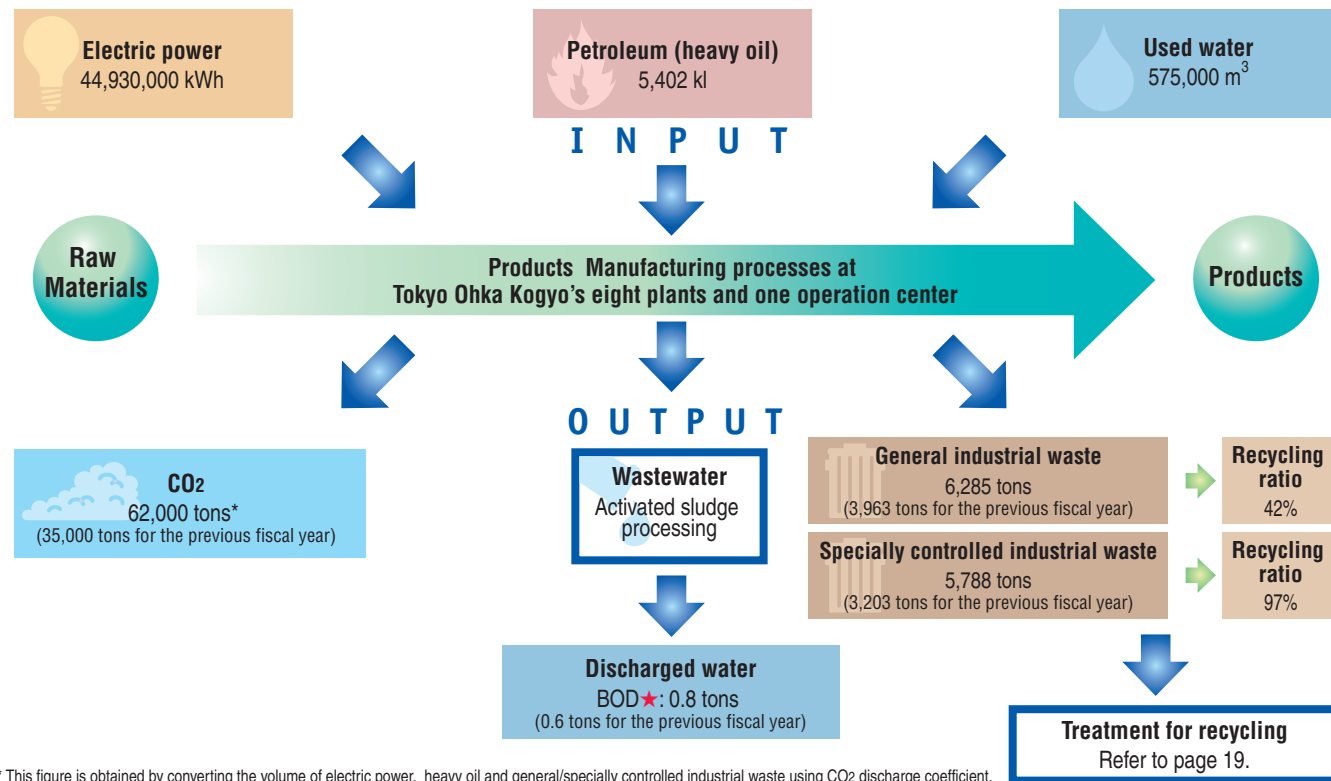


Emergency contact card (yellow card)

## Environmental Impact of Business Operations

We use and process synthetic resins, organic solvents, photosensitive materials, inorganic chemicals and other raw materials to manufacture and market photoresist and its related chemicals, as well as specialty chemicals chiefly used in the electronics industry. In addition, we manufacture and market plate-making materials and other products used in the printing and plate-making industries.

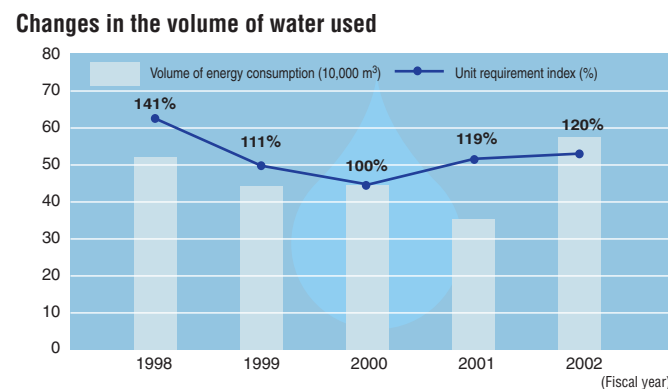
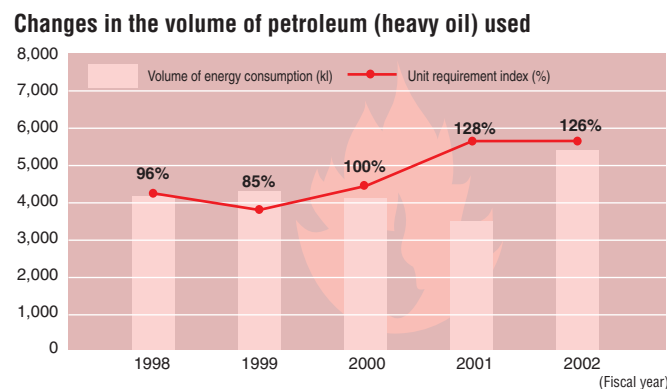
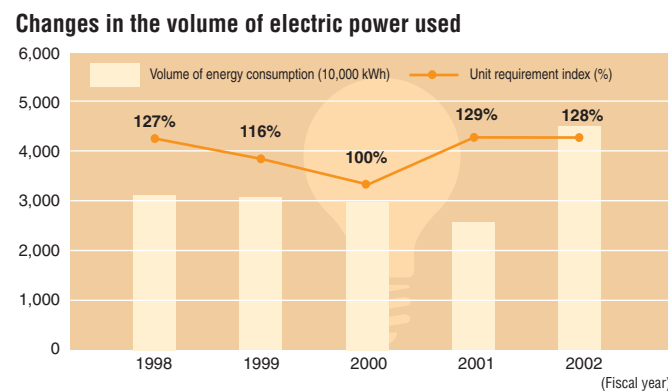
In these fields, resin-based general industrial waste and specially controlled industrial waste, including inflammable waste oils, may have a significant impact on the environment, and for this reason, we endeavor to reduce the volume of waste generated by our operations. In fiscal 2002, however, the number of sites for data collection was increased from six to eight plants plus one operation center, and therefore, measurements rose over many of the control points.



## Reduction in the Input of Energy Resources

Due to the review and improvement of manufacturing processes, the total volume of electric power, petroleum (heavy oil) and water used has continued to fall over the past few years. However, it rose in fiscal 2002 due to the number of data collection sites increasing from six to eight plants plus one operation center.

Due to active energy-saving measures and the renewal of plant facilities, the unit requirement★ indexes generally declined during fiscal 2002, although some did rise due to the effects of rises in production volumes. In the future, we will further consider how to lower these indexes in order to promote energy conservation.



## Promotion of Efforts to Reduce Environmental Impact during Production

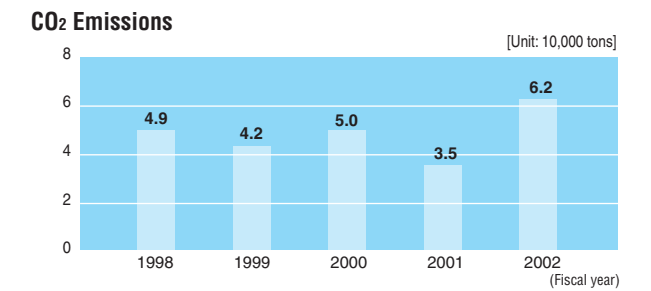
In fiscal 2002, measurements rose at many of the control points because the number of data collection sites increased from six to eight plants and one operation center.

### Measures for Reducing Greenhouse Effect Gas★ Emissions

We are striving to reduce greenhouse effect gas emissions and keep them low by the following strategies: improving production processes, switching from existing boiler fuels to alternative ones and managing production facilities properly.

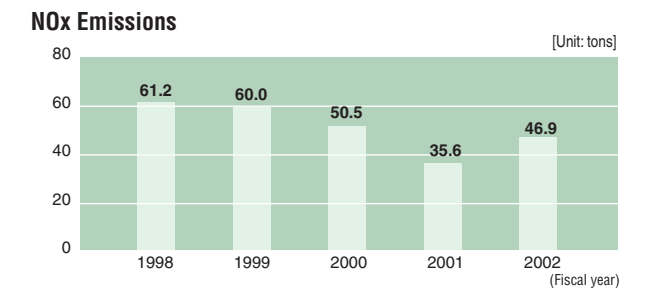
#### Introducing Cogeneration Systems

At Koriyama Plant, we introduced three boilers for cogeneration systems★. These collect the waste heat produced when we generate our own power and reuse it. By doing this, introducing environment-friendly facilities and implementing environmental measures, we have worked hard to achieve a greater level of energy efficiency when compared to CO<sub>2</sub> emissions.



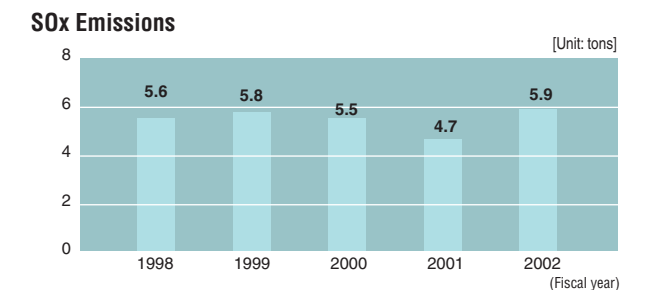
#### Introducing Battery-powered Forklifts

We are promoting a shift to battery-powered forklifts in order to reduce the quantity of greenhouse effect gases (exhaust gases) and noises arising from forklift operation in the plant and to protect the health of forklift operators. To date two battery-powered forklifts have been introduced at the distribution control center. A campaign aimed at turning forklift engines off when they are idle, is also being carried out.



#### Activities for Reducing SO<sub>x</sub> Emissions

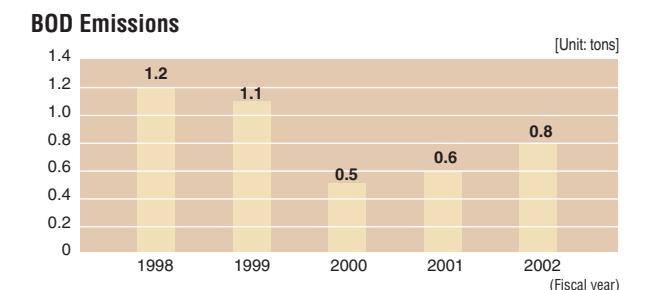
When plants are being renewed and old boilers are replaced, boiler fuels are being actively switched over to natural gas, low-sulfur heavy oil and other fuels that generate a smaller amount of sulfur oxides, the cause of global warming and atmospheric pollution. The intention of this is to reduce the amount of greenhouse effect gas emissions.



#### Discharging Wastewater into Public Waters and Soil

Wastewater is being discharged into public waters after it has been treated using activated sludge processing.

Due to efforts for proper operation and maintenance of wastewater treatment facilities and improvements in production processes, the volume of wastewater discharged had continued to decline over the past few years. In fiscal 2002, however, it grew because the number of data collection sites increased. In the future, we will continue to review our production processes to reduce the volume of wastewater discharged.



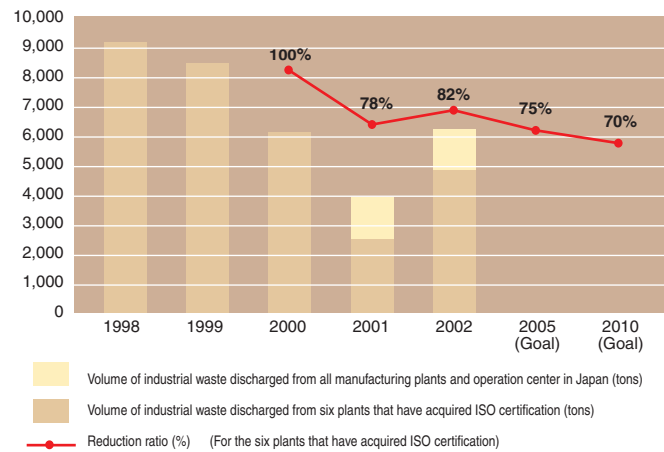
## Efforts Directed at Zero Emissions

The awareness of the general public is shifting from “the earth is inexhaustible and does not deteriorate” to “the earth is exhaustible and is deteriorating”. Backed by this shift and other factors, businesses are being urged to move toward the creation of a “recycling-based society”, which is based on a completely different concept from the conventional one of mass production and mass disposal. Tokyo Ohka Kogyo is promoting the “Reduce, Recycle and Reuse” campaign toward achieving zero emissions★.

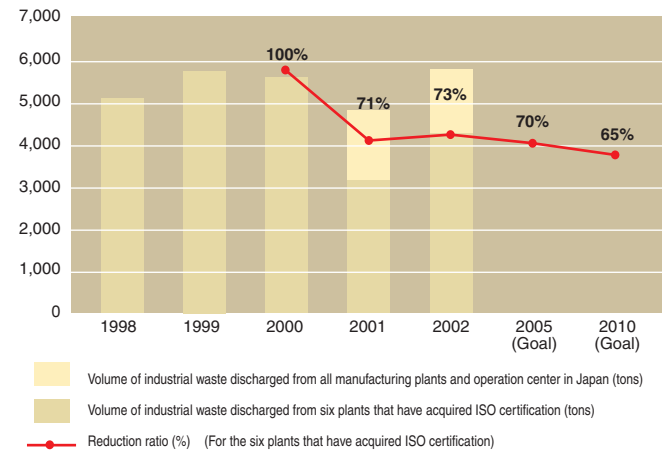
### Reduce★

We are striving to reduce the amount of energy used and waste generated by improving our production processes.

#### General Industrial Waste



#### Specially Controlled Industrial Waste



### Recycle★

We are implementing diverse recycling programs in order to utilize the limited resources effectively.

#### Recycling of Used Products and Waste Liquids from Production Processes

We are working to reduce the volume of industrial waste and control carbonic acid gas emissions by selling the organic solvents used and collected from products and production processes to collectors/disposers. We are also collecting organic solvents for recycling by distillation and other means.

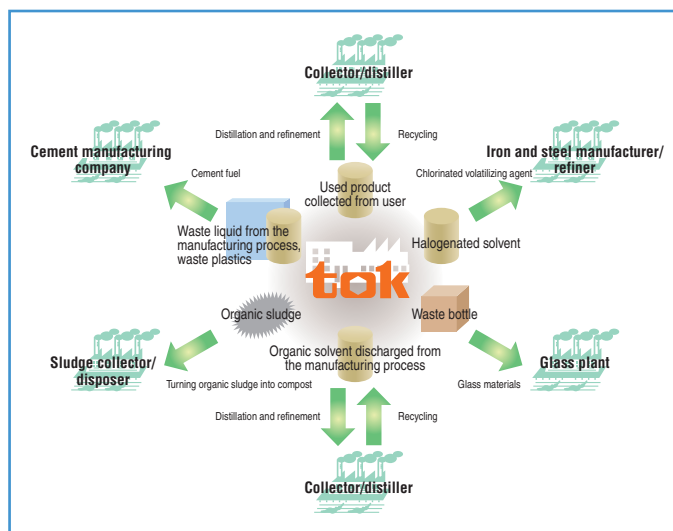
Meanwhile, products that are difficult to collect by distillation and other means are recycled under Tokyo Ohka Kogyo's Recycling-based Production System.

#### Turning Organic Sludge into Compost

The important elements of organic sludge processing are: (1) volume reduction, (2) stabilization, and (3) elimination of harmful substances. Volume reduction involves a process of condensing the water in sludge, dehydrating and then desiccating to reduce the volume of sludge handled. Stabilization involves degrading organisms in sludge through biochemical or thermochemical processing (including combustion) to prevent decomposition and other types of chemical action that cause environmental pollution. At present, these processes are combined for composting★ organic sludge at the facilities of collectors/disposers.

#### Reusing Halogenated Solvents as Chlorinating Agents for Nonferrous Metal Roasting Furnaces

Halogenated solvents are reused as chlorinated volatilizing agents during the impurity removal process associated with nonferrous metals smelting.



### Reuse★

Since the second half of the 1970s, in order to promote container reuse, products based on organic solvents have been transported in returnable stainless-steel containers. In recent years, these containers have become much larger, and 1-ton tanks and tank trucks have come into wider use. A shift to returnable containers is also under way for some of the photoresist products, chiefly ones used in the manufacture of liquid crystal displays.



18-liter returnable containers



1-ton returnable containers

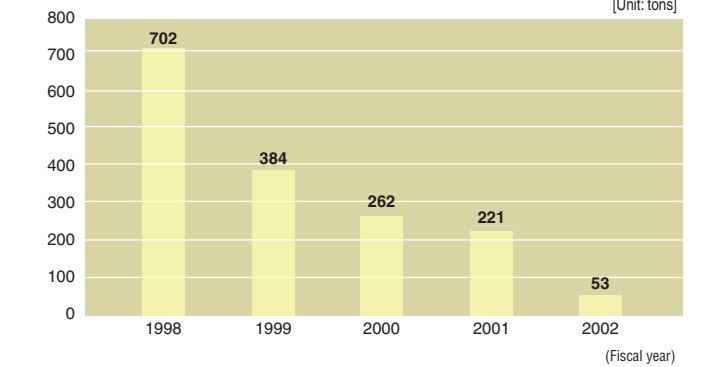


Tanker truck

### Landfilled Waste

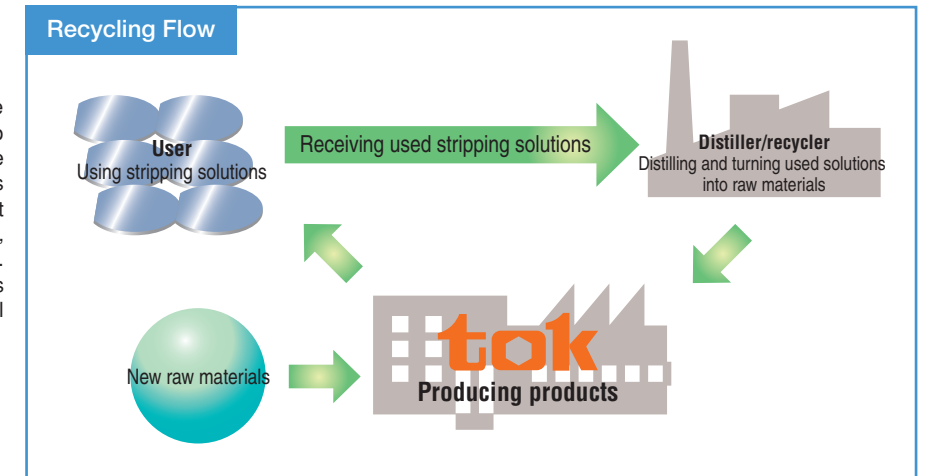
We are promoting activities such as minimizing the volume of waste material generated and reconsidering how to dispose of waste material by making determined efforts to sort waste materials. Thus we are working hard toward the goal of achieving zero emissions for landfills at all sites.

#### Landfilled Waste



### Establishing a Recycling-based Manufacturing System

Semiconductor manufacturers, which purchase our products, sell used solvents to collectors/disposers. Liquids, in which a large amount of resin is dissolved after use, such as photoresist stripping solutions, however, cannot be sold to collectors/disposers, and therefore, such liquids are recycled at Tokyo Ohka Kogyo. Chlorinated stripping solutions are used as chlorinating agents for nonferrous metal roasting furnaces.



### Managing Chemical Substances

In March 2000, the Law Concerning Reporting, etc. of Releases to the Environment of Specific Chemical Substances and Promoting Improvements in Their Management (PRTR★ Law) was enforced. This legislation required businesses to manage and report the volume of chemical substances released and transferred. We handle 25 of the 354 kinds of chemical substances covered by the PRTR Law.

Government ordinance number	Designated chemical substance name	Volume of substances transferred to the air (tons)	Volume of substances transferred to waters (tons)*	Volume of substances turned into waste material (tons)
16	2-aminoethanol	0.1	—	21.0
19	3-amino-1H-1,2,4-triazole	0.0	—	0.0
25	Antimony and its compounds	0.0	—	0.0
40	Ethylbenzene	5.4	—	0.6
43	Ethylene glycol	0.0	—	0.0
44	Ethylene glycol monoethyl ether	0.0	—	0.3
45	Ethylene glycol monomethyl ether	0.2	—	4.1
63	Xylene	22.0	—	0.3
67	Cresol	0.0	—	21.0
101	2-ethoxyethyl acetate	1.6	—	48.0
113	1,4-dioxane	3.3	—	80.0
139	O-dichlorobenzene	0.1	—	18.0
224	1,3,5-trimethylbenzene	0.0	—	0.2
227	Toluene	8.0	—	0.8
238	N-nitrosodiphenylamine	0.0	—	0.0
252	Arsenic and its compounds	0.0	—	0.0
253	Hydrazine	0.0	—	0.0
260	Pyrocatechol	0.0	—	0.7
266	Phenol	0.0	—	6.3
272	Bis (2-ethylhexyl) phthalate	0.0	—	0.0
283	Hydrogen fluoride and its compounds	0.0	—	0.1
304	Boron and its compounds	0.0	—	0.2
309	Poly (oxyethylene) nonylphenyl ether	0.0	—	0.0
316	3-epoxypropyl methacrylate	0.0	—	0.0
320	Methyl methacrylate	0.0	—	0.0

\* None of these chemical substances are discharged into public waters because they are subjected to activated sludge processing.

## Contribution to Local Communities

In order to conform to one of our corporate policies, "Contribute to society", we have carried out a wide range of social activities, including environmental preservation, in various local communities with the aim of reviving Japan's beautiful natural environment. In the future, we will continue to be actively engaged in such social activities.

### Major Volunteer Activities

#### Sagami Operation Center

We take part in activities such as cleaning the Sagami River, which runs near to the Sagami Operation Center. We patrol the river in order to prevent waste material from being illegally disposed of. In addition, about 60 employees and their family members participated in the local community program called "The All Samukawa Town Beautification Campaign" that cleaned up parks, roads and other areas in the town.



Street activities by the civic group that keeps the Sagami River clean



Activities aimed at keeping the Sagami River clean

#### Kumagaya Plant

As part of the "No-Garbage-in-the-Industrial-Complex Campaign", we worked with neighboring businesses to clean nearby parks and remove trash and fallen leaves from the roads and sidewalks.



#### Gotemba Plant

We continue to maintain the biotope (dragonfly pond) created to reconstruct local hills and mountains in the adjustment pond and its vicinity within the plant for research and studies. Twenty species of dragonflies are currently being observed.



Shojoutombo



Hosomiatsunetanbo

#### Aso Plant

In order to protect *Miyamakirishima* (a type of rhododendron), we cleaned the slopes of Mt. Aso's sommas where this Precious Natural Resource grows in groups.



### Plant Tours

#### Yamanashi Plant

Every year, students from high schools located near to our plants are invited to go on a tour of the plant. The tour provides educational support through explanations about products and production facilities.



Explanations about our company and its products



Scene of a wastewater treatment facility tour



Scene of a plant facility tour

Representatives from chambers of commerce and industry are also invited to visit our plant in order to promote communication with them concerning industrial safety and environmental preservation.

## Efforts to Prevent Labor Accidents

In order to prevent labor accidents, the Industrial Safety and Health Committee has been formed to promote organized accident prevention activities at each site. In terms of facilities various sensors for detecting abnormalities have been installed to prevent accidents from occurring. In addition, manuals are in place so that appropriate action can be taken in emergencies. Education and training is provided to the employees in a systematic way (for the implementation of training programs, see page 13).

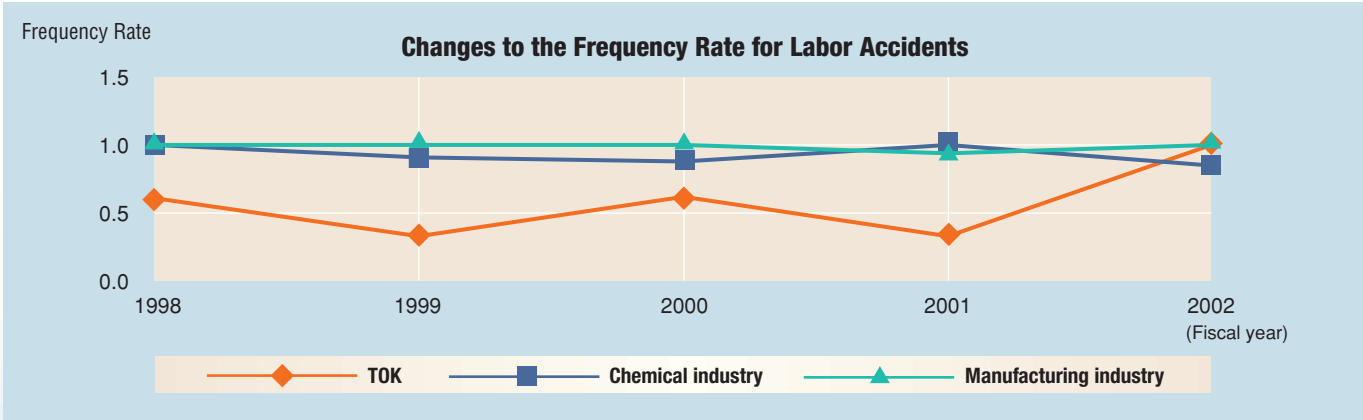
At each site, various large pump plants are available for fire fighting. Fire hydrants and fire extinguishing agents are also available, and a system is in place in which if a fire or other incident occurs, a self-protecting fire fighting unit will immediately turn out to cope with the initial fire fighting until the public fire fighting units arrive.

### Changes in the Frequency and Intensity Rates

We are conducting operations in a systematic way at all sites in order to achieve the goal of completely eliminating accidents that result in a day off work or longer. Unfortunately, however, in fiscal 2002 three accidents occurred, increasing the frequency rate by 0.6 percentage points.

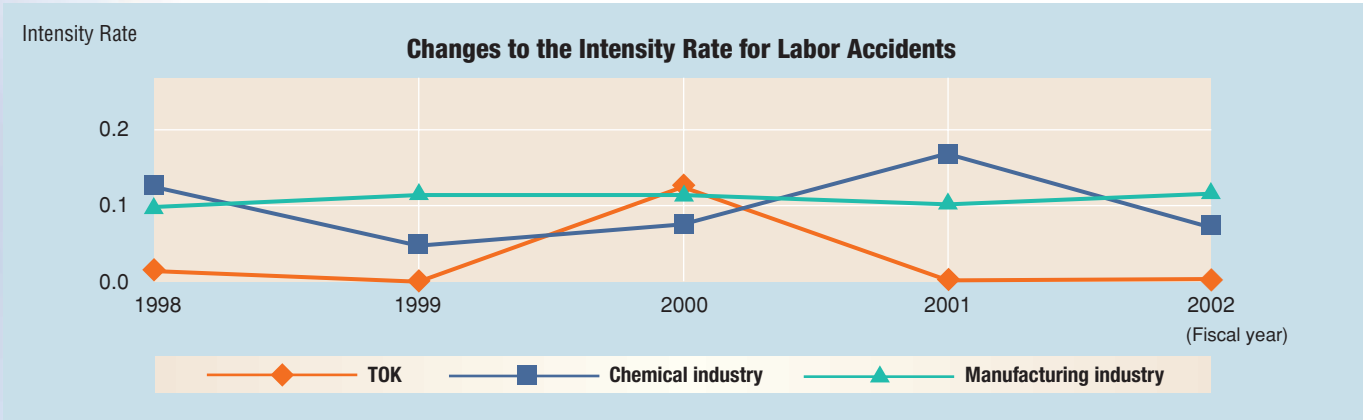
In the future, we will step up our efforts towards total elimination of accidents.

#### Frequency Rate



Frequency rate = (casualties due to labor accidents/total working hours) x 1,000,000  
Casualties due to labor accidents, however, indicate those who have been killed or injured and have taken one or more days off work.

#### Intensity Rate

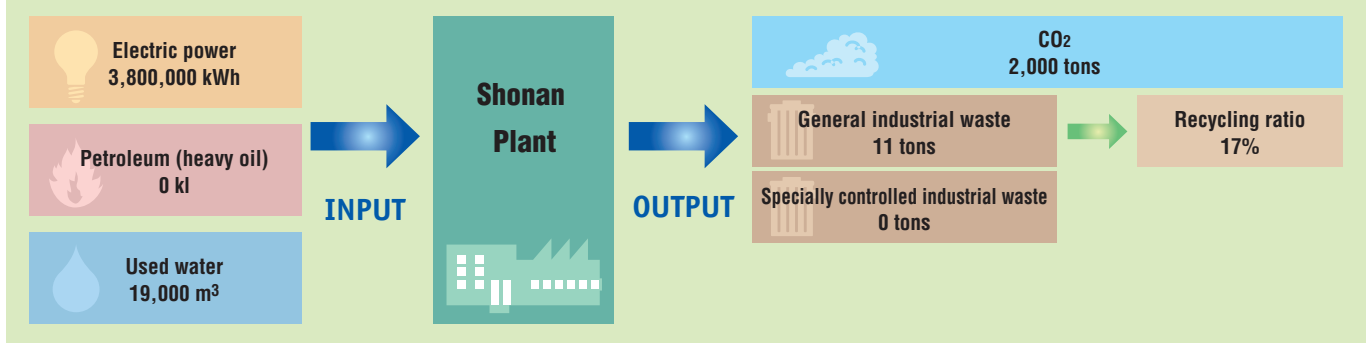
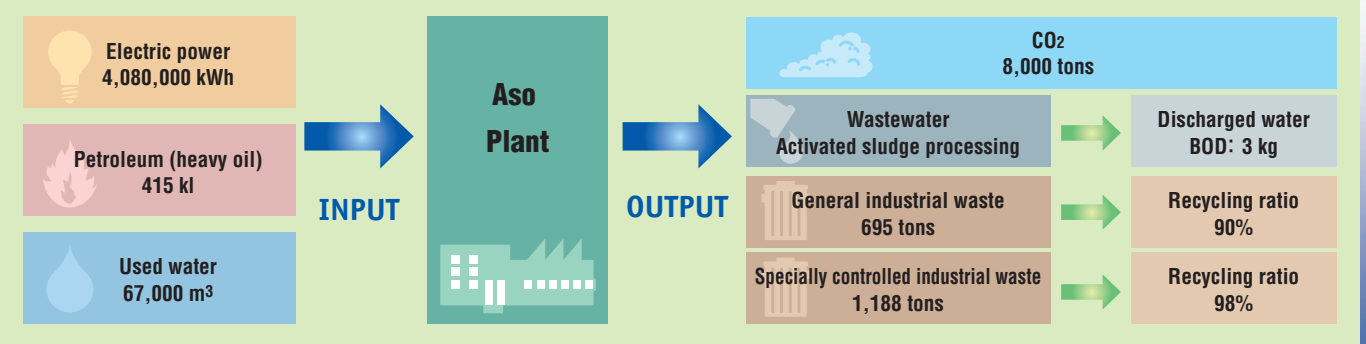
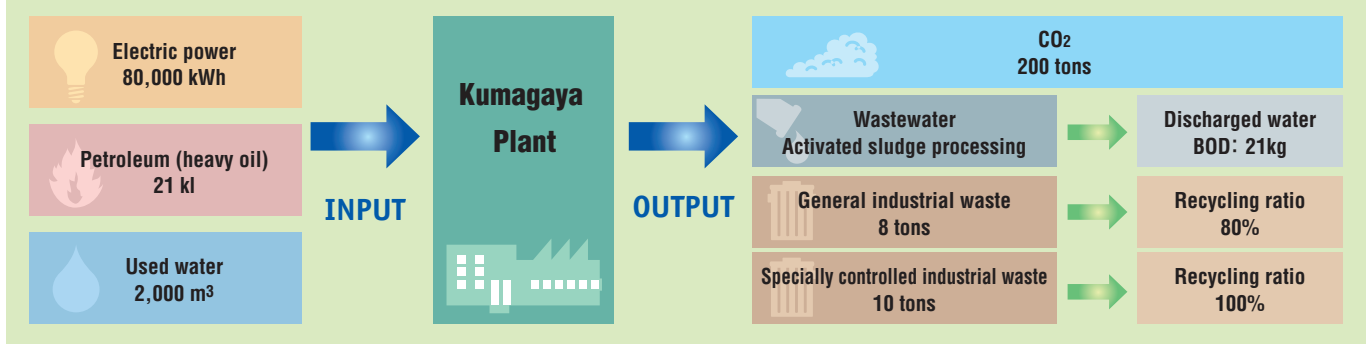
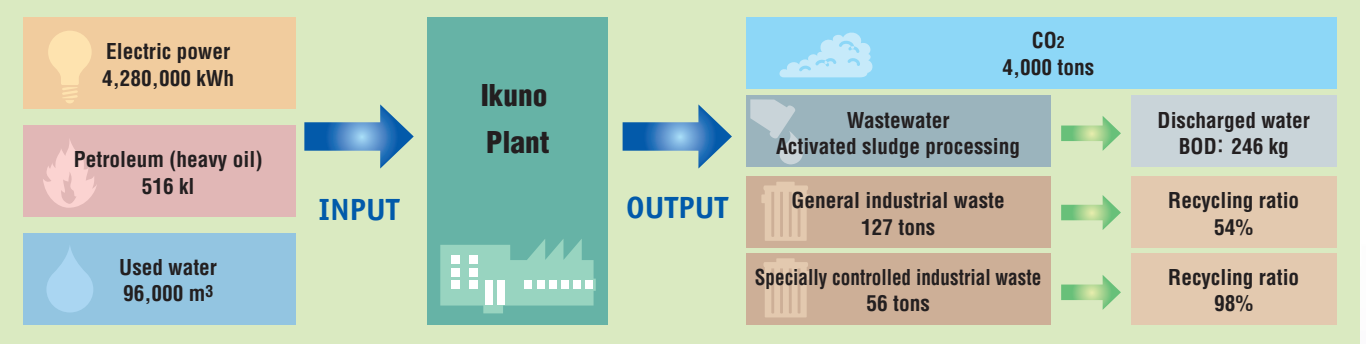
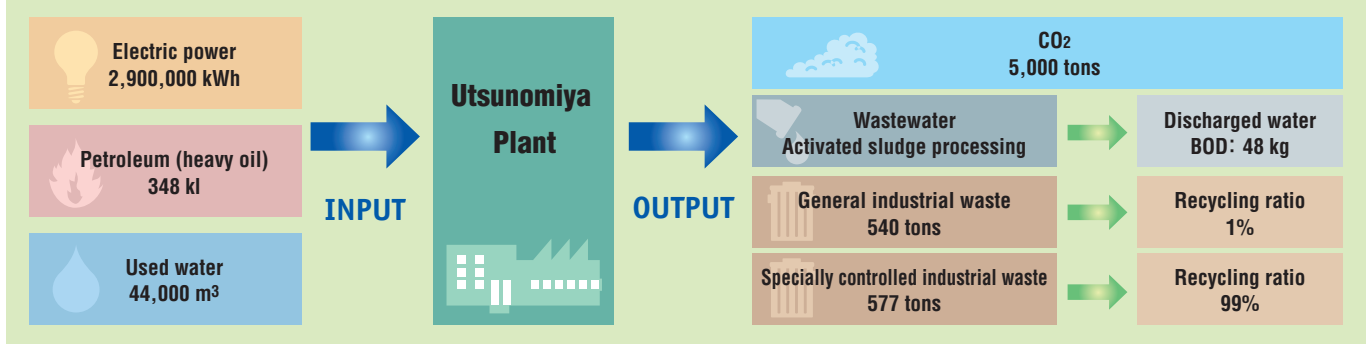
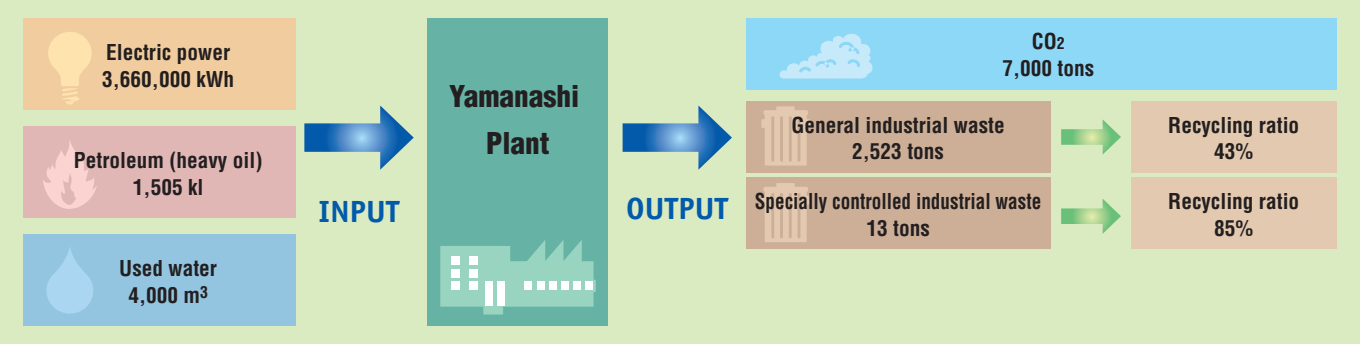
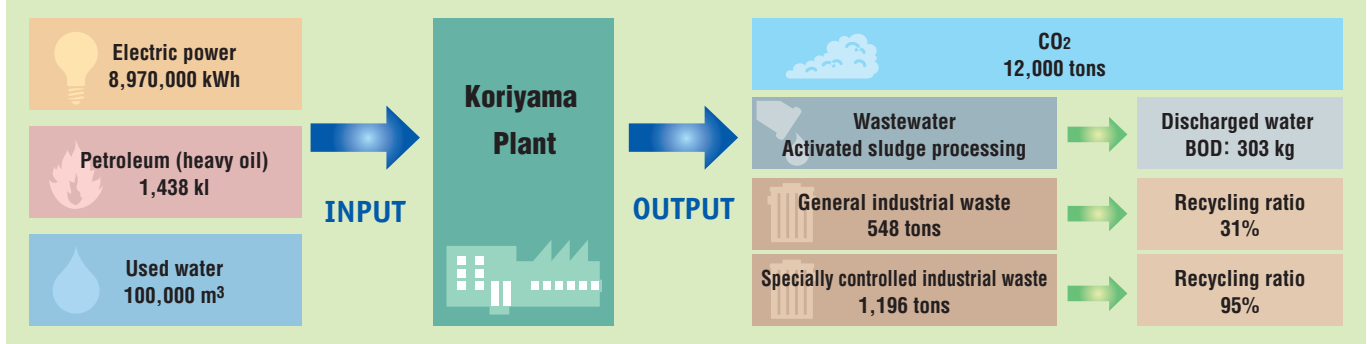
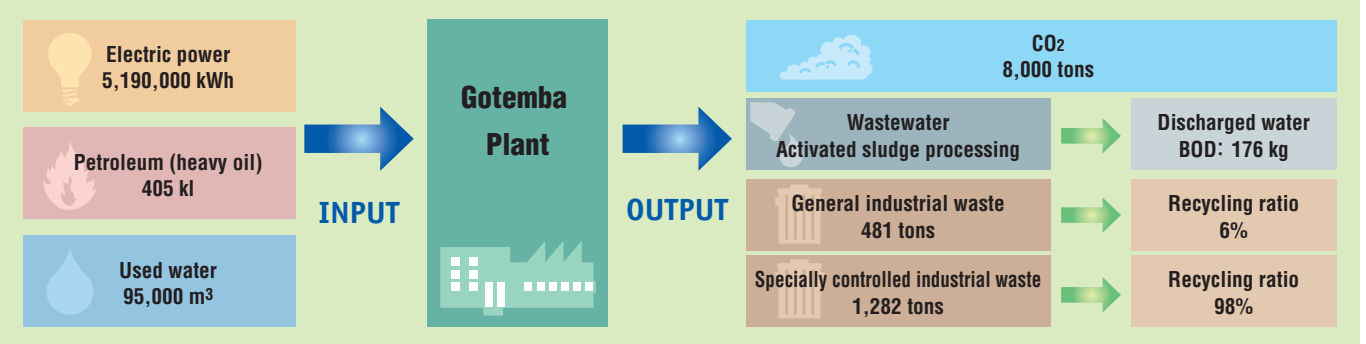
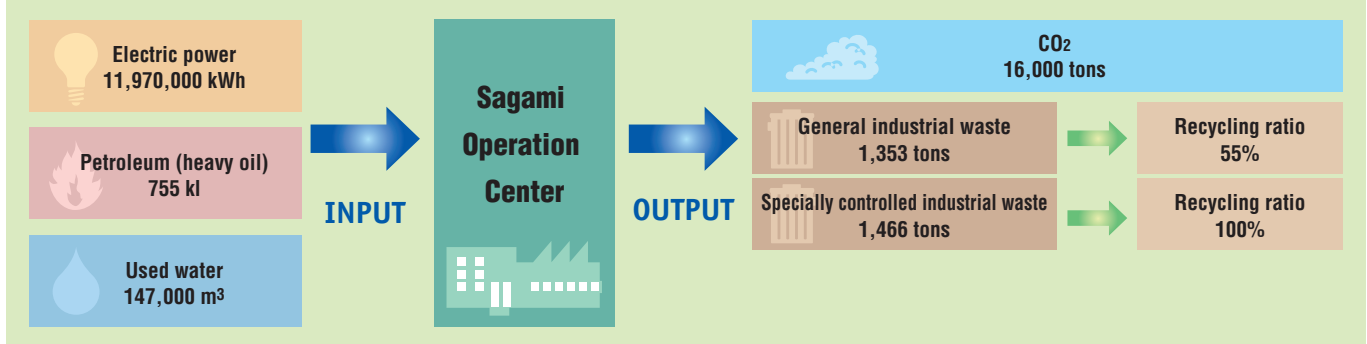


Intensity rate = (idle man-days/total working hours) x 1,000  
Idle man-days mean total idle man-days resulting from casualties due to labor accidents.  
Idle man-days are calculated using the following standards:  
Death: 7,500 days  
Permanent total inability to work: Number of days for Grade 1 to 3 physical disabilities specified in the attached table (7,500 days)  
Permanent partial inability to work: Number of days for Grade 4 to 14 physical disabilities specified in the attached table (50 to 5,500 days according to the applicable class)  
Partial inability to work: Number of days obtained by multiplying the number of idle calendar days by 300/365

Data on the chemical and manufacturing industries used in the tables come from *The Results of Labor Accident Trend Surveys* published by the Ministry of Health, Labour and Welfare.

# Data on Environmental Impact by Site

## Data on Environmental Impact by Site



## History of Environmental Preservation Activities

Period	Major events
1970 – 1989	<ul style="list-style-type: none"> <li>● The Committee for the Prevention of Pollution is established.</li> <li>● Wastewater treatment facilities are completed at Sagami Plant.</li> <li>● A permit for industrial waste disposal business is obtained.</li> <li>● The Hazardous Substance Management Committee is formed.</li> <li>● The Environment Compliance Section is set up.</li> <li>● The Energy Conservation Committee is established.</li> <li>◆ Receives the National Industrial Health Week Prize from the Kumamoto Labor Standards Bureau in recognition of Aso Plant's efforts.</li> </ul>
1990 –1995	<ul style="list-style-type: none"> <li>◆ Sagami Operation Center records 5.4 million hours of Class 1 no-accident operation and receives a record-making certificate from the director-general of the local labor standards bureau.</li> <li>◆ Sagami Operation Center is officially commended by the Kanagawa Prefecture Environmental Preservation Council for its environmental preservation activities.</li> <li>◆ Aso Plant wins an official commendation from the Kumamoto Prefecture Association for the Safety of Hazardous Goods.</li> <li>◆ Gotemba Plant is officially commended by the Shizuoka Prefecture Federation of Labor Standards Associations as an excellent place of business in terms of industrial health.</li> <li>● Start recycling of used stripping solution by users.</li> <li>◆ Aso Plant receives the Excellent Place of Business Award from the Kumamoto Prefecture High-pressure Gas Safety Association.</li> <li>◆ Sagami Operation Center wins the Best Award for Electricity Use Rationalization from the Kanto Region Electricity Use Rationalization Committee.</li> <li>● The ISO Office is set up.</li> <li>◆ Ikuno Plant receives the Industrial Health Excellence Award from the Tajima Labor Standards Association.</li> </ul>
1997	<ul style="list-style-type: none"> <li>◆ Utsunomiya Plant is officially commended by the Governor of Tochigi for its efforts in preventing disasters caused by hazardous substances.</li> <li>● Natural gas boiler facilities are introduced at Sagami Operation Center.</li> </ul>
1998	<ul style="list-style-type: none"> <li>● The Safety Control Section is set up.</li> <li>● The Committee for Promoting Acquisition of ISO14001 Certification is formed.</li> <li>◆ Utsunomiya Plant is officially commended by the Tochigi Labor Standards Bureau for its efforts to raise the level of industrial health.</li> <li>◆ Aso Plant wins official recognition at the Kumamoto Prefecture Industrial Safety and Health Convention.</li> <li>● Environmental policies are established.</li> <li>● Environmental manuals are developed.</li> </ul>
1999	<ul style="list-style-type: none"> <li>◆ Ikuno Plant receives the Industrial Safety Excellence Award from the Tajima Labor Standards Association.</li> <li>● Sagami Operation Center, Koriyama Plant and Yamanashi Plant are designated as Class 2 Energy Management Plants.</li> <li>◆ Koriyama Plant is officially commended by the Fukushima Labor Standards Bureau for its superior business operations.</li> <li>● Koriyama, Utsunomiya and Gotemba Plants acquire ISO14001 certification.</li> </ul>
2000	<ul style="list-style-type: none"> <li>● Used solvent collection and refining started.</li> <li>◆ Aso Plant receives the National Industrial Safety and Health Week Superiority Award from the Kumamoto Labor Standards Bureau.</li> <li>● The Eco Ice environment-friendly air-conditioning system is incorporated into the new head office building.</li> <li>● Aso and Ikuno Plants acquire ISO14001 certification.</li> </ul>
2001	<ul style="list-style-type: none"> <li>● Yamanashi Plant acquires ISO14001 certification.</li> <li>◆ Aso Plant is officially commended by the Association for the Safety of Hazardous Goods at the National Convention for the Safety of Hazardous Goods.</li> <li>● A biotope is created in Gotemba Plant.</li> </ul>
	 <p>Aso Plant</p>
2002	<ul style="list-style-type: none"> <li>◆ Ikuno Plant receives the Industrial Health Superiority Award from the Tajima Labor Standards Association (April).</li> <li>◆ Kumagaya Plant wins official recognition by the Saitama Prefecture Federation of the Associations for the Safety of Hazardous Goods (May).</li> <li>◆ Utsunomiya Plant is officially commended by the Kanto-Koshinetsu Region Federation of the Associations for the Safety of Hazardous Goods (May).</li> <li>● Cogeneration systems are introduced at Koriyama Plant.</li> <li>● Battery-powered forklifts are introduced at Distribution Control Center.</li> <li>● The 2002 Environmental Report is published (October).</li> </ul>
	 <p>Utsunomiya Plant</p>
2003	<ul style="list-style-type: none"> <li>◆ Koriyama Plant is officially commended by the Koriyama Regional Fire Fighting and Disaster Prevention Association (May).</li> <li>◆ Kumagaya, Shonan, Yamanashi and Aso Plants respectively receive a certificate confirming continuous no-disaster operation from the Japan Chemical Industry Association (May).</li> </ul>

◆ Indicates that Tokyo Ohka Kogyo received an award or prize.

## Glossary

### ■ A Recycling-based Society

As opposed to a society characterized by mass production, mass consumption and mass disposal, a recycling-based society refers to a society that aims to achieve both environmental preservation and pursuit of economic efficiency by reducing the volume of waste material generated and promoting its reuse and recycling while at the same time minimizing the input of new resources.

### ■ Biotope

Biotope is a German term made up of the word "bio" meaning "life", and the word "top" meaning "place". The compound word means "a certain limited place where wild animals and plants live".

### ■ BOD

Biochemical oxygen demand (BOD) refers to the volume of oxygen required when pollutants in the water (organic substances) are turned into inorganic substances or gases through the action of microorganisms. BOD is a major indicator used when evaluating the degree of contamination of rivers and other water bodies. A higher value for BOD means that the water involved is more contaminated.

### ■ Cogeneration System

A cogeneration system is an energy supply system that effectively utilizes waste heat generated at the same time that power is generated as a heat source for hot water supply, heating and other purposes. It significantly enhances energy utilization efficiency when compared to conventional power generation systems.

### ■ Composting

Composting is the process of turning sludge, raw garbage and other kinds of organic waste into fertilizer using microorganisms to ferment the waste. Compost thus created can be used as an agricultural fertilizer and soil conditioner.

### ■ Eco Fund

The Eco Fund is a general term for investment trusts in which, in addition to the traditional measures for investment in stocks, such as total market value, business scale and financial position, corporate efforts to address environmental issues are used as one of the evaluation criteria for choosing stocks in which investments should be made.

### ■ Environmental Accounting

Environmental accounting is a system for understanding environmental preservation-related investments made by, and expenses incurred by, businesses and other organizations, as well as the effects of such investments, in quantitative terms (currency or physical quantity) and communicating such information to stakeholders. It is different from the accounting system as stipulated in the Commercial Code.

### ■ Environmental Audits

Environmental audits involve the systematic, corroborative, periodic and objective assessment of compliance by a business with environmental laws and regulations, implementation of its environmental policies and achievement of its environmental objectives and goals. In Japan, they constitute an essential precondition for acquiring ISO14001 certification.

### ■ Environmental Performance

Environmental performance evaluation is a method of evaluating, in qualitative and quantitative terms, environmental activities and results achieved by an organization in accordance with its environmental policies, objectives and goals.

### ■ Greenhouse Effect Gas

Greenhouse effect gases are gaseous bodies present in the atmosphere, which transmit sunlight well but absorb infrared rays emitted from the ground and sea surfaces. They are believed to cause global warming. At the Third Session of the Conference of the Parties to the United Nations Framework Convention on Climate Change held in Kyoto in 1997, six kinds of greenhouse effect gases – carbon dioxide, methane, nitrous oxide, hydrofluorocarbons (HFC), perfluorocarbons (PFC), sulfur hexafluoride (SF<sub>6</sub>) – were chosen as the target of reduction efforts.

### ■ ISO14001

The ISO14001 standards relate to international standards that provide for requirements that have to be met by businesses and other entities when they establish an environmental management system (EMS) within their organization. The International Organization for Standardization (ISO) created these standards.

### ■ JIS Z 7250

The JIS Z 7250 standards are the section of the Japanese Industrial Standards (JIS) that provides for the items, content of descriptions and overall structure for material safety data sheets (MSDS).

### ■ MSDS

Material Safety Data Sheets refer to documents that include basic information on chemical products, including the names of chemicals contained and their content ratios, as well as information on how to handle them, their danger and hazard levels, their effects on the environment, safety measures to be taken, etc. In order to promote improvements in appropriate management by industrial companies of such chemicals, MSDSs are distributed by chemical product suppliers to the users or handling entities for each product.

### ■ PCB

One kind of organic compound, polychlorinated biphenyl (PCB) was formerly considered a chemical that excelled in terms of heat resistance and electrical insulation and was used for thermal media, insulating oils, paints and other applications. However, due to their lack of degradability and high toxicity, PCB production was discontinued in 1972. Nevertheless, there is little progress in its disposal, and managers responsible for its storage are required to place it under strictly controlled conditions.

### ■ PRTR

The Pollutant Release and Transfer Register (PRTR) is a system for collecting and officially announcing data on the sources and how much of hazardous chemicals have been released into the environment or carried out of the plant as waste material.

### ■ Recycle

Recycling refers to using waste material as a resource instead of burying it in the ground or destroying it by fire. This is done in order to save resources and prevent environmental pollution. Recycling efforts include material recycling, which involves collecting waste material and recycling it to produce new raw materials for products, and thermal recycling, which involves collecting waste material and reusing it as fuel.

### ■ Reduce

Reduce refers to reducing the volume of waste material generated. This involves minimizing the volume of materials put into the manufacture of products with the aim of keeping the volume of materials discarded as small as possible.

### ■ Reuse

Reuse involves using manufactured goods, containers and other products repeatedly with the aim of reducing the volume of waste material generated and conserving resources.

### ■ Unit Requirement

The unit requirement is a value obtained by converting the volume of consumption for a certain resource, such as the volume of energy consumed, into a value based on a certain standard unit, such as a unit of sales or production volume. In this report, the unit requirement is expressed as an index calculated with the fiscal 2000 level at 100%.

### ■ Zero Emissions

The concept of zero emissions aims at establishing a new production system in which all members of society endeavor to eventually reduce all kinds of waste material to zero by, for example, recycling waste material generated by production activities in one industry or using it as raw materials for other industries. This concept was proposed by the United Nations University.

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