Environmental Report 2004

Our Commitment to the Environment, Safety, and Health

Chemistry with a heart
TOKUYAMA

TOKUYAMA Envi

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Editorial Notes

This *Environmental Report 2004* was prepared with the aim of bringing Tokuyama's activities on the environment, safety, and health in fiscal 2003 to the attention of all concerned, such as stakeholders, customers, employees and their families, people living near its sites, and the general public. The report now contains a broader range of information and more data based on actual figures compared with last year's report. It also contains performance data of Tokuyama's group companies to the fullest extent possible. The report follows the corresponding guidelines (2003 edition) issued by the Ministry of the Environment.

Scope of Report

Period: From April 2003 to March 2004

Companies: Tokuyama Corporation. The 10 consolidated manufacturing companies are also covered in some data.

Region: Activities in Japan

Summary of Business

Company Outline

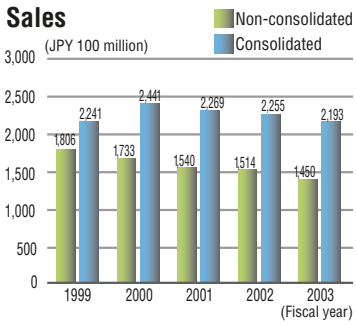
Established: February 16, 1918

Headquarters: Shibuya Konno Bldg. 3-1, Shibuya 3-chome, Shibuya-ku, Tokyo 150-8383, Japan

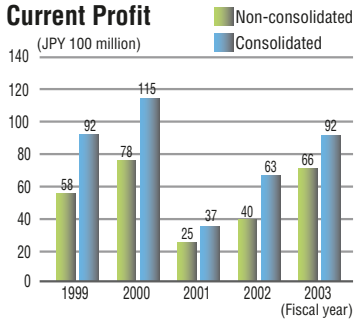
Production and Research Sites: Tokuyama Factory, Kashima Factory, Tsukuba Research Laboratory

Capital: JPY 19,273 million (as of March 31, 2004)

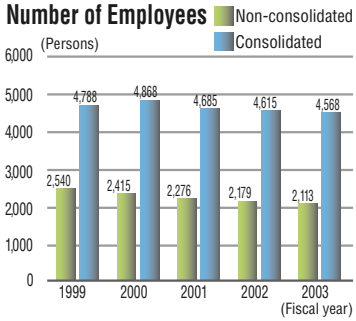
Sales



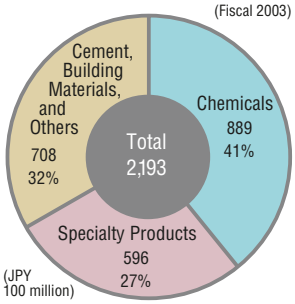
Current Profit



Number of Employees



Segmental Sales Breakdown



Business Segments and Main Products

Segment	Main Products
Chemicals	Caustic soda, soda ash, calcium chloride, sodium silicate, vinyl chloride monomer and polyvinyl chloride, propylene oxide, isopropyl alcohol, methylene chloride, biaxial-oriented polypropylene films, multilayer co-extrusion films, cast polypropylene films, microporous films
Specialty products	Polycrystalline silicon, amorphous precipitated silica, fumed silica, aluminum nitride, dental materials, pharmaceutical, agricultural chemical bulks and intermediates, plastic lens materials, ion-exchange membranes, methylene chloride for washing metal, solvent for semiconductor base materials, environment-related items, medical diagnosis systems, gas sensitive semiconductors
Cement building materials and others	Ordinary Portland cement, high early strength Portland cement, blast furnace slag cement, ready-mixed concrete, plastic window sashes, cement type stabilizer, waste treatment

Message from the President

Working toward creating a sustainable society with the concept of "Environmental Management" placed at the core of our managerial strategies.

Economic and social activities in the 20th century, characterized by mass production and mass consumption, have greatly benefited human beings. On the other hand, they have also brought about environmental problems, such as global warming and concerns about the depletion of natural resources. Reflecting on this situation, we must be determined to make the 21st century the "Century of the Environment," in which we pay full respect to the value of the global environment and make efforts to ensure our harmonious coexistence with it. The chemical industry has made available a variety of chemical products to society and contributed to enhancing the wealth of our life. At the same time, as a chemical company, we are well aware of the indispensable necessity of giving due consideration to the environment and human health to ensure that they are not harmed by chemical products.

The above viewpoint has driven us to voluntarily conduct activities according to the spirit of Responsible Care which is globally active in the chemical industry. We put emphasis on protecting the environment, safety, and human health over the entire life cycle of our chemical products, that is, from product development through production, distribution, and application, to final consumption and disposal.

We have chosen to add "Environment and Energy" to our key growth strategy and also decided to implement the concept of "Environmental Management" at the core of our strategies in our mid-term corporate plans. We believe that the concept of "Environmental Management" is an important management approach that addresses environmental issues as critical concerns. Based on this approach, we have set ourselves the mission of enhancing corporate value, contributing to creating a sustainable society and being environmentally responsive through restructuring all aspects of our business activities, from research and development to manufacturing and selling.

Taking advantage of our unique position as a manufacturer of both chemicals and cements, we have maintained our resolute commitment to recycling by-products and waste materials. In 2000, we established our Recycling and Environmental Department, and in fiscal 2003, it handled 1,460,000 tons of outsourced waste materials and by-products for use in cement production. We will maintain these activities that help reduce consumption of natural resources, thereby contributing to creating a "Sustainable Society" and positioning ourselves where society and customers can call Tokuyama Corporation their "Company of Choice."

Ongoing environment-related technological innovations that realize reduced environmental load and preservation of natural resources through recycling technology are expected to further facilitate economic and social activities. It is said that such developments will cause an "Environmental Revolution" in the 21st century; a revolution that will be comparable to the "Industrial Revolution" and the "IT Revolution." In line with this, our Company is committed to taking a role in the "Environmental Revolution" as a "Chemical Company with Technological Core Competence."

July 30, 2004

Shigeaki Nakahara
President

Basic Philosophy

By setting ourselves a definite basic policy and action objectives, we are committed to promoting company-wide environmental management and to sufficiently fulfilling our corporate social responsibilities in an effort to realize a sustainable, recycling-based society.

Basic Policy

As a member of the Japan Responsible Care Council, Tokuyama Corporation carries out Responsible Care activities that protect the environment and preserve safety and health throughout the entire chemical substance life cycle, from development and manufacturing, to distribution, use, final consumption, and disposal. Our social mission is to aggressively tackle and solve environmental issues in particular, which, in turn, will lead to sustainable corporate and social development. Based on this recognition, we are promoting "Environmental Management," a management policy that emphasizes the environment, in all of our business activities, including development, manufacturing, and sales.

Action Objectives

1. **Promote environmental protection.**
   - Implement ISO14001 based Environmental Management System and reduce environmental loads.
2. **Observe laws and regulations.**
   - Observe international rules, local laws and regulations, and industrial standards.
   - Thoroughly practice internal export control rules.
3. **Promote energy conservation and curb global warming.**
   - Achieve the lowest unit energy consumption in the industry for each of our products.
4. **Promote resource recycling and work towards the reduction and proper management of waste materials.**
   - Promote material recycling and thermal recycling of resources.
   - Work towards the paperless office.
5. **Promote process safety, disaster prevention, and occupational health and safety.**
   - Aim for zero accidents and disasters based on principles of safety self-management and self-responsibility.
   - Secure comfortable work environment and protect people's safety and health.
6. **Ensure strict product safety standards.**
   - Offer environmentally-oriented products that can be safely used.
   - Provide clear information on how to use the product and what care to take.
7. **Deepen trusting relationships with the society.**
   - Publicly disclose information on Company's activities concerning environmental protection, process safety, occupational health and safety, and chemical product safety.
   - Actively pursue dialogue with local communities.

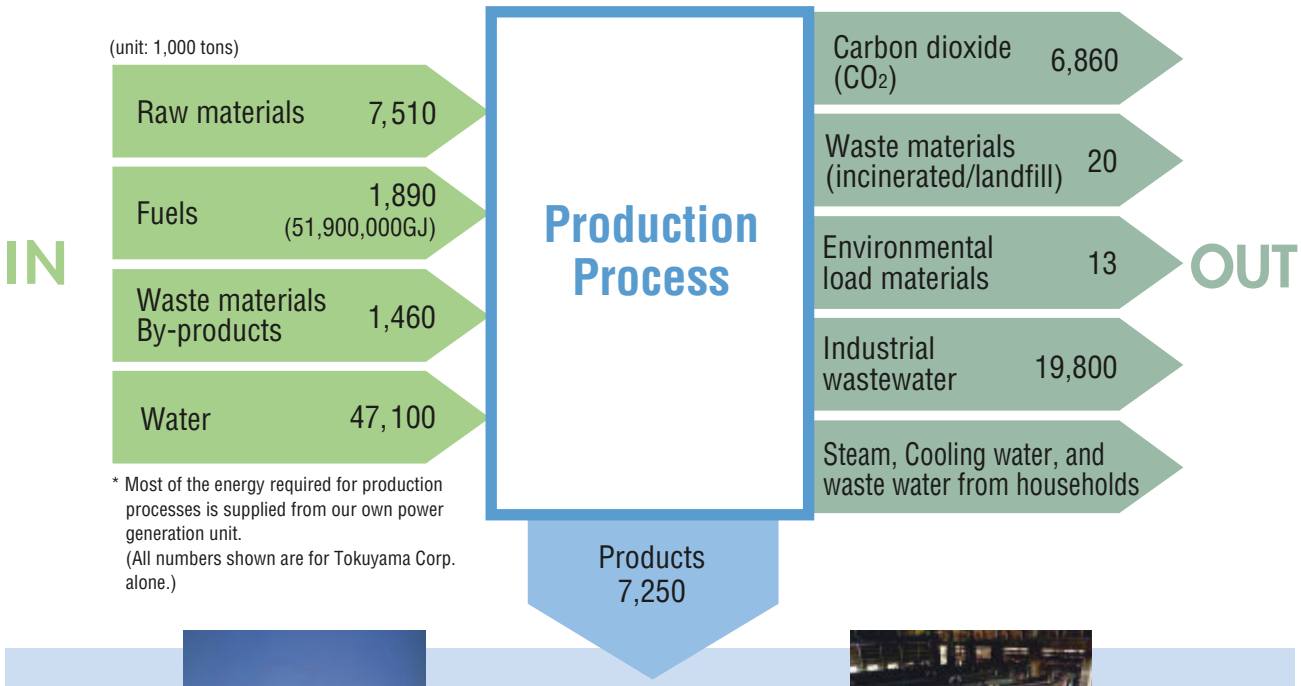
Environmental Goals

- **Achieve a 15% reduction in unit energy consumption from 1990 levels by 2005.**
- **Raise the effective waste utilization rate to 92% by 2005.**

Responsible Care: Responsible Care (RC) is a self-management activity by a company that either manufactures or handles chemical substances, to implement and improve measures for protecting the "Environment, Safety, and Health" of society and staff throughout the chemical substance handling process—from inception in the research and development through manufacture, distribution, and use, to final consumption and disposal. These activities also includes public disclosure of company performance and social dialogue. Born in Canada in 1985, Responsible Care has spread to 47 countries. The Japan Responsible Care Council (JRCC) was established in 1995 within the Japan Chemical Industry Association and has 111 members registered as of March 2004.

Material Flow Balance in Our Production Activities

We accurately determine environmental loads from the input and output balance in our overall production activities, and come up with measures to reduce the loads for respective categories.




Soda ash


Caustic soda electrolytic cells

Chemical products
- Caustic soda
- Soda ash
- Vinyl chloride
- Microporous films

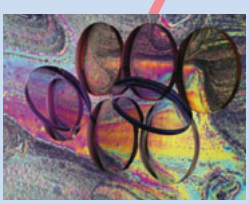

Vinyl chloride monomer plant


Solvents for semiconductor base materials

Specialty products
- Polycrystalline silicon
- Aluminum nitride
- Plastic lens materials
- Solvents for semiconductor base materials

Cement, Building materials and Others
- Cement
- Cement type stabilizer
- Plastic window sashes
- Construction and housing materials


Polycrystalline silicon


Photochromic lens materials


Aluminum nitride


Cement (Nukui Dam)


Plastic window sashes

Results of Fiscal 2003 Activities

Each factory has its own detailed target values to meet in reducing environmental loads. The headquarters and the branch offices are also actively involved in pursuing energy conservation, sorted waste recovery and disposal, and green procurement.

Our Commitment to the Environment

Promotion of Responsible Care Activities

Responsible Care calls for implementation of environmental preservation, process safety, occupational health and safety, chemical and product safety, distribution safety, and social dialogue. As a member of the Japan Responsible Care Council, we are actively promoting Responsible Care activities.

Implementation of Management System

We are adapting ourselves to various standards so that our activities can be regulated. We have implemented and are operating across the company to ISO 9001, ISO 14001, using a Safety and Health Management System. We are also recommending our group companies and subcontractors to introduce the same.

Contribution to a Recycling-based Society

Our contribution to building a recycling-based society is active within the cement business.

Environment-oriented Handling of Products throughout their Life Cycles

Efforts are under way to aggressively pursue environmental load reduction in product manufacturing, recycling of waste materials, and energy conservation.

Results and Evaluation of Fiscal 2003 Performance

- We have implemented measures to reduce environmental loads, such as SOx, NOx, and substances that concern PRTR, and carried out recovery and recycling of solid materials in wastewater, waste heat recovery, and thermal recycling of waste plastic materials.
- The effective utilization rate of waste materials has improved thanks to our continual efforts to promote waste material recycling. Our efforts also include a process of reducing waste material disposal, which helped significantly reduce landfill disposal.
- We have achieved an improvement in the unit energy consumption as we aggressively pursued energy conservation projects and thermal recycling in fiscal 2003.
- There was a marginal to no rise in COD, PRTR substances, and dust emissions.
- Among hazardous air pollutants, those controlled under self-management have shown a slight decrease thanks to the voluntary reduction measures that we implemented.
- We have taken measures to be compliant with the new requirements (such as total volume control) of the revised Chemical Substance Control Law* and Water Pollution Control Law.
- We have made particular efforts to save on electricity in air conditioning and lighting, and promoted use of recycled paper as part of our "Green Procurement"* campaign.

Fiscal 2003 RC Activities—Priority Issues and Solutions

Segment	Priority Issues	Solutions
Management	Review by Senior Management	• RC Administration Committee • Safety and Environmental Inspection
Environmental preservation • Environmental load reduction • Energy conservation • Recycling	• Environmental load reduction (e.g., SOx, NOx) • Reduction in emission of PRTR substances and hazardous air pollutants • Improvement in unit energy consumption • Higher waste material effective utilization rate and lower landfill disposal amount • Promotion of Green Procurement campaign • Measures to comply with environment-related laws	• Reduction in emission of SOx and hazardous air pollutants • Thermal recycling of waste plastic materials • More energy conservation • Waste material recycling • "Green Procurement" of office supplies and lighting equipment • Implementation of Environmental Management System
Process safety	• Zero accidents and injuries • Distribution safety	• Safety and Environmental assessment • Voluntary safety certification on high pressure gas facilities • Safety education and inspection of distribution companies
Occupational health and safety	• Zero accidents and injuries	• Implementation of Health and Safety Management System
Chemical product safety	• Ensured product safety	• Product assessment • Improvement of MSDS • Participation in the HPV program
Trusting relationships with local communities	• Participation in community activities • Co-existence with local communities	• Participation in community's volunteer activities • Hosting dialogue meetings with local communities • Factory tours for community members
Promotion of RC program to group companies	• Dissemination of RC activities	• Safety and environmental inspection • Acquisition of ISO certification • Sharing of RC-related information

Fiscal 2003 Environmental Management Activities (Tokuyama alone)

Segment	Items		Unit	Target	FY 2002	FY 2003	Year-over-Year
Pollution control	Air	SOx	tons/year		2,010	1,880	–130
		NOx	tons/year		10,400	10,900	+500
		Soot and Dust	tons/year		235	254	+19
	Water	COD*	tons/year		134	135	+1
Global environment conservation	Energy conservation	Unit energy consumption index** (compared to 1990)	%	–15 (FY 2005)	–13.4	–16.7	–3.3
Reduced waste materials	Recycling	Waste material effective utilization rate	%	92 (FY 2005)	93.9	94.8	+0.9
PRTR*	PRTR		tons/year		90	98	+8
	Hazardous air pollutants		tons/year		53	49	–4

* Total of Tokuyama and Kashima factories
** Recalculated retrospectively to 1990 based on the Energy Conservation Law enforcement regulations (e.g., revised coefficients) of 2003.

* **The Chemical Substance Control Law** is a law governing inspection of chemical substances and control of manufacturing such substances. It identifies toxic effects on human health of chemical substances and controls the manufacture, importation, and use of chemical substances that are liable to cause damage to human health via environmental contact.
* **Green Procurement policy** refers to such procurement efforts that not only emphasize price, quality, and design, but prioritize environment-friendly products.

Environmental Accounting

Aiming to secure effective environmental investment, we have adopted an Environmental Accounting system since fiscal 2000, enabling us to clearly assimilate and analyze investments and expenditures related with environmental conservation.

In fiscal 2003, the amount of investments remained roughly level while expenditures slightly increased on a year-on-year basis. Our effort to efficiently utilize waste materials helped improve economic benefits.

Environmental Conservation Costs

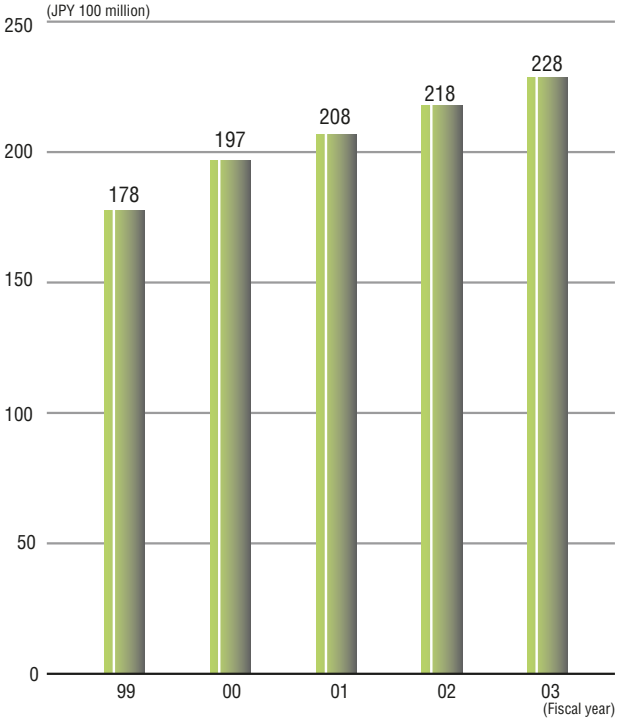
Antipollution and global environmental conservation-related investments shared over 40% of total environmental investments.

Major environmental items in fiscal 2003 included installation of the waste plastic material combustion facilities in our cement factory, and replacement of the electrostatic precipitators in cement production facilities and our own power plant.

Economic Benefits

Economic benefits are evaluated based only on actual revenue figures, where any projected benefits are excluded, in areas of energy conservation, sales of relevant materials, and reutilization of waste materials, which helps minimize processing for disposal and reduce consumption of raw materials and fuel. In fiscal 2003, we saw an increase of nearly 240 million yen in revenue over the previous year (calculated to our standards), thanks to the economic benefits generated primarily by boosted waste material recycling and reutilization.

Trends of Accumulated Environmental Investments
(cumulative since FY 1990)



Environmental Conservation Costs

Classification	Major Expenditure Items	Major Activities	Amount Invested (JPY million)	Total Expenditure (JPY million)
Factory site costs	Pollution prevention	Installation/Renewal of drainage water treatment system, waste gas treatment system, electrostatic precipitator, etc.	426	3,486
	Global environment conservation	Installation of energy conservation facilities	442	507
	Resource recycling	Distilling column revamp, installation of product waste recovery system and storage facility for sorted recycling materials	89	1,143
Upstream/downstream costs			0	1
Costs of management activities		Installation of analysis system for environmental measurements	48	252
Research and development costs		Environment-related technological development	0	218
Costs of social activities		Factory greening, preparation of RC reports	6	35
Costs of environmental damage		Dues, Disused mine sites administration	0	206
Total			1,011	5,848

* Costs were compiled according to "Environmental Accounting Guideline—2002" of the Ministry of the Environment.
* All company factories are covered.

Economic Benefits

Item	Material Benefits (1,000 tons)	Economic Benefits (JPY million)	Remarks
Benefits from energy conservation	—	204	Benefits from lower electricity and steam consumptions
Revenues from salable materials	96	116	Revenues from selling metal scraps, waste oils, waste acids and alkalis
Benefits from lower waste materials processing costs	262	682	Processing costs reduced by reutilization of waste materials
Benefits from lower raw material and fuel consumption realized by waste reutilization	265	486	Raw materials and fuels costs reduced by reutilization of waste materials
Total		1,488	

RC Promotion System and Management Systems Operation

We have established an internal system that enables Planning, Implementation and Operation, Performance Assessment and Corrective Actions to be carried out in an appropriate and effective manner. Our efforts continue in promoting swift and effective environmental measures and pursuing constant improvement.

RC Promotion System

Our RC Administration Committee, which draws up the highest level policies on our RC activities, is chaired by the president and comprises corporate management members. The committee discusses and approves company-wide RC policies and other environment, safety, and quality-related policies. Under this committee are various other subcommittees: the Environmental Measures Committee, the Safety Measures Committee, the Product Safety and Quality Assurance Committee, and the Product Assessment Committee. These subcommittees are responsible for discussing specific activity plans in areas of environmental management, safety management, and quality management, as well as product safety assessment. Each subcommittee is chaired by a corporate director responsible for the relevant company-wide issues. Heads of appropriate sections are assigned as subcommittee members.

Management System for Environment Activity Assessment

The Company prepares a mid-term (3 years) environmental plan each year. To implement the plan, we set ourselves yearly policies and goals, based on which each segment prepares specific plans for implementation. The activities undertaken are assessed at the fiscal year end and the results reflected in plan for the following year.

Operation of Management Systems

ISO 14001 Environmental Management System

Both our Tokuyama and Kashima factories have acquired ISO 14001 certification, one of the main international standards and on which we base our Environmental Management System.

In line with company-wide environmental policy, each factory sets itself an environmental policy and the specific goals to be achieved in areas covering lowering environmental loads, energy conservation, reducing waste material disposal, and promoting resource recycling.

At the company headquarters, branch offices, and research laboratories, activities are under way based on their respective policies and goals in the areas of energy conservation, reducing waste material disposal, and resource recycling.

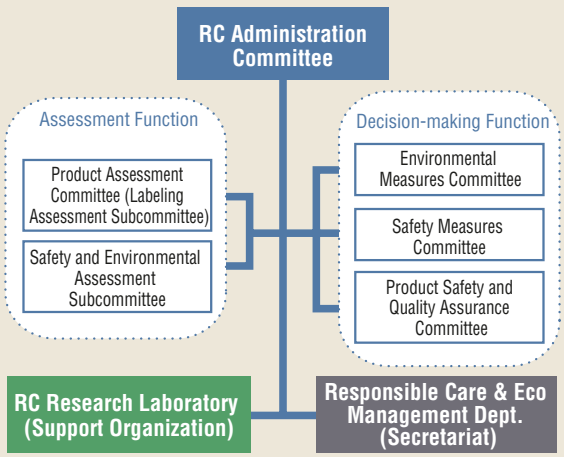
ISO 14001

ISO 14001 is one of the major international standards developed by the International Organization for Standardization (ISO), and provides the requirements for Environmental Management Systems. ISO 14001 certification is awarded to an organization that, based on the environmental management system implemented according to a systematized process, operates its business in an environment-oriented manner and achieves continual improvements through corrective actions, as necessary.

ISO 9001 Quality Management System

We have also acquired ISO 9001 certification (Quality

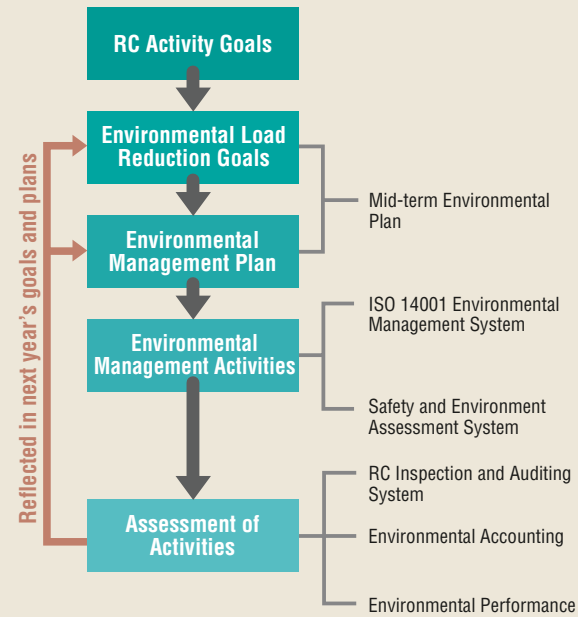
RC Promotion System



Safety of chemical substances are checked and their environmental impacts are assessed using simulations. Environmental measurements, work environment measurements, and ultra-trace analyses of controlled substances and chemical pollutants are also carried out.

Promotes RC activities throughout the Company and its group companies covering areas of the environment, safety, and quality.

Management System for Environmental Activity Assessment



Management System) for our major products. In fiscal 2003, our Sales and Development forces also participated in the Quality Management System, which has resulted in even greater customer satisfaction.

ISO 9001

ISO 9001 is one of the major international standards developed by the International Organization for Standardization (ISO), and provides the requirements for Quality Management Systems. It enables a company to establish dependable quality management systems within its organizations and thereby further address customer satisfaction.

Health and Safety Management System

Based on the "JCIA—New Occupational Health and Safety Guidelines" of Japan Chemical Industry Association, we have implemented a Safety and Health Management System within our respective factories and commenced operation of these in fiscal 2003.

Health and Safety Management System

In the area of occupational health and safety, this system requires the company to list dangerous/hazardous tasks, make risk assessments, and provide appropriate measures to be adopted for such tasks in the order of the highest risk first, thereby lowering the overall risk level. Performance is continually and systematically improved as the above activity proceeds in a cycle of "Planning —Action—Assessment—Corrective Action." The "JCIA—New Occupational Health and Safety Guidelines" are prepared for chemical companies, based on the relevant guidelines issued by the Ministry of Health, Labor and Welfare, as well as International Standard OHSAS 18001.

Assessment Systems

With the necessary assessment systems in place, we are working towards lowering environment- and safety-related risk levels.

The Safety and Environmental Assessment Subcommittee and the Product Assessment Committee are at work making strict assessments on environmental, safety, and product safety management performance.

Safety and Environmental Assessment

Before any facility is newly installed, expanded or refurbished, we require a safety and environmental assessment to be carried out. The assessment is designed to check the design safety of equipment, the safety of the materials being handled, compliance with laws and regulations, and impacts on the environment. This helps us in our effort to make our facilities safe and easy to operate, easy to maintain, and accident-free. The assessments apply to three stages: Basic Plan Assessment, Design Assessment, and Pre-Operational Assessment. Through such stages, assessments are made to ensure that facilities are of safe and environment-oriented design, built to the design requirements, and ready for operation.

Product Assessment and Labeling Assessment

To ensure product safety, our Product Assessment process is in effect at each stage, from research and development through to shipment of our products. This risk assessment covers a variety of aspects including safety of the chemical substances involved, environmental impacts, human health effects, compliance with laws and regulations, etc.

Our Labeling Assessment helps us ensure that the labels that we carry on our products contain no defects in their instructions and/or warnings and that they contain sufficient and easy-to-understand information.

Inspection and Auditing System

Our Inspection and Auditing System is in place to help us verify that activities undertaken at each factory are in line with company-wide policies.

Safety and Environmental Inspection

We apply this inspection on a yearly basis to check the appropriateness of our accident/disaster preventive measures and management quality concerning environmental conservation. The inspection team is headed by the corporate director chairing the Environmental and Safety Measures Committee, and conducts inspections at the respective factories, distribution sections, and the health management center.

A report is compiled from the inspection results and distributed to all those concerned. The results are also reported to the company president.


Safety and Environmental Inspection (Left: Tokuyama Factory; Right: PCB waste in a waste control area)

Internal Auditing

Our internal auditing is carried out periodically in accordance with ISO 9001, ISO 14001, and Safety and Health Management System procedures. Progress status of the planned actions and the systems operational status are audited, and areas of nonconformity identified for corrective actions.

Third Party Auditing

We are audited by registrars for certification of ISO 9001 and ISO 14001. In fiscal 2003, we underwent the RC verification process, which is provided by the Japan Responsible Care Council with the aim of further strengthening our Responsible Care activities and making such activities more transparent to the public. We were pleased to achieve a high score. (See page 26 for details.)

ISO 9001 auditing (Cement Production Dept.)

Promotion of Green Procurement

We have Green Procurement Standards in place, based on which we are actively promoting a Green Procurement campaign in purchasing copying paper and other office supplies.

Education and Training

Employee education and training on the Responsible Care activities are provided on a hierarchical group basis.

For environmental management, safety management, occupational health and safety, and quality management, "On-the-Job-Training" is provided so that employees can learn through actual management activities.

Reducing and Recycling Waste Materials

1. Our Cement Factory Recycles Waste from Outside

We not only recycle our own internal waste and by-products but accept and recycle a large volume of waste and by-products from other industries and local municipalities.

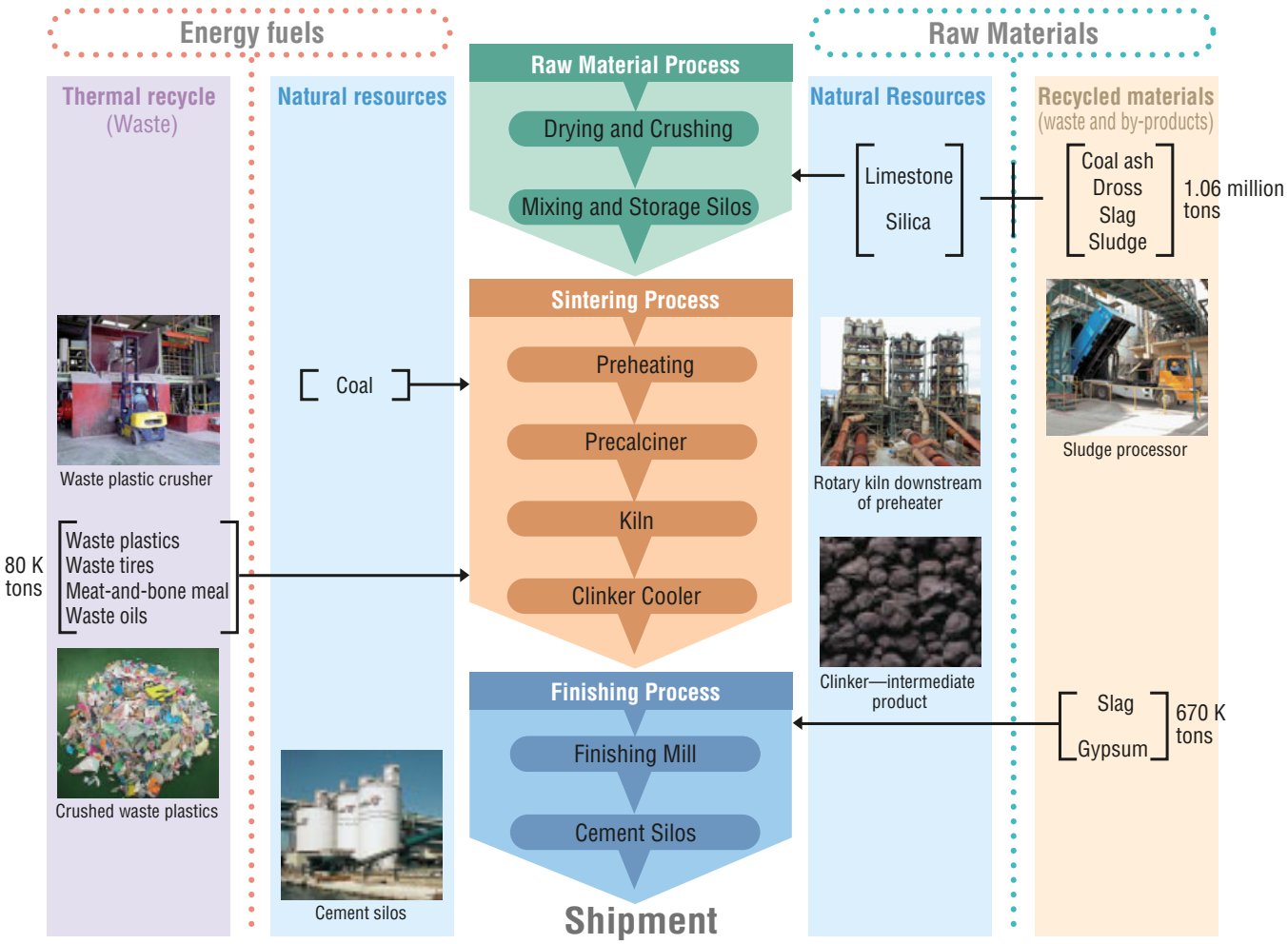
Supporting a Recycling-Based Society

Our cement factory, which commenced operations in 1938, was designed to be capable of effectively utilizing the by-products from our own soda ash plant and coal cinders from our own power plant as part of the raw materials for cement. Today we also accept and recycle a large volume of waste and by-products from outside.

Many of the waste and by-products can be used as raw materials and fuels in the cement manufacturing process as they contain common components such as limestone, clay, and silica. The internal temperatures of the cement kiln* reach as high as 1000–1800 °C, high enough to allow complete combustion of any combustible materials. Another feature is that the ash remaining after combustion are still used as a constituents of cement, thereby leaving no residues such as incineration ash.

What this means in practical terms is that the all waste is efficiently recycled as thermal energy or raw materials. Such effective utilization of waste and by-products in our cement factory provides significant support in shaping a recycling-

Flow Diagram of the Waste and By-products Recycling Process in Cement Manufacturing



*A cement kiln is a rotating furnace used to sinter the raw materials in the cement factory.

based society as it helps reduce consumption of depleting natural resources and carbon dioxide (CO_2) emissions, and prolongs the functional life of final disposal sites.

The waste materials and by-products reutilized in our cement factory in fiscal 2003 amounted to 1,810,000 tons, including 350,000 tons of our waste. Of this, 1,730,000 tons were used as the raw material substitutes (Material Recycling*) and the remaining 80,000 tons were used as fuel substitutes (Thermal Recycling*). The unit waste consumption per ton of cement increased to 401 kg from 381 kg of the previous year, which is a 5.2% increase.

Recycling a Variety of Waste Materials

Waste Plastics

We started burning waste plastics in the cement kiln for thermal recycling in 1999, and expanded our annual recycling capacity to 85,000 tons by installing waste plastic crushing units in fiscal 2001 and 2003. A total of 62,000 tons of waste plastics were recycled in fiscal 2003.

Waste Tires

We have facilities to feed chipped waste tires into the cement kiln, and recycled 3,000 tons of waste tires in fiscal 2003.

Coal Ash/Sludge

We accepted a total 1,060,000 tons of coal ash from thermal power plants and sewage sludge from municipal sewerage systems, and used them as the clay substitutes in fiscal 2003.

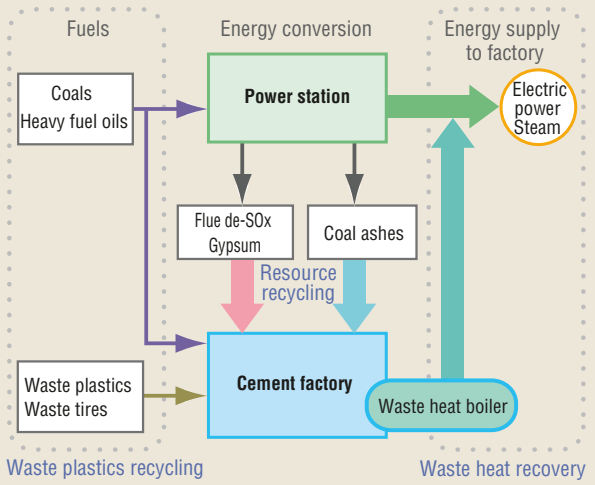
Meat-and-Bone Meal

Despite the current complete ban on meat-and-bone meal use as livestock feed and fertilizer, they are being produced every day, and their disposal has become an issue. Meat-and-bone meal combustion in the cement factory is understood to be safe and allows a large volume to be handled. Our cement factory has been accredited by the Ministry of the Environment and has been engaged in the meat-and-bone meal disposal since May 2002. The factory handled 680 tons of meat-and-bone meal in fiscal 2003.

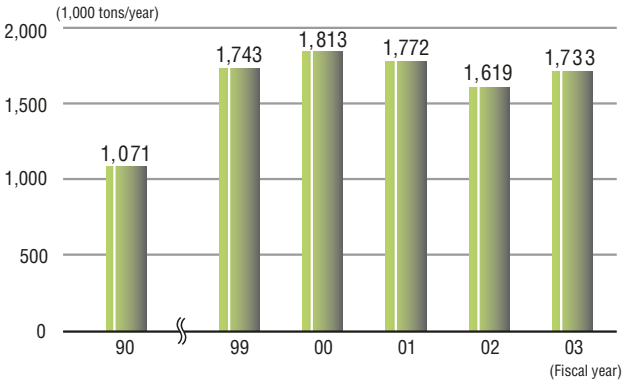
Recycling Municipal Waste Incineration Ash (Yamaguchi Eco-Tech Co., Ltd.)

Yamaguchi Eco-Tech Co. (a joint venture company between Tokuyama and Ube Industries Ltd.) handles the recycling of municipal garbage incineration ash produced in Yamaguchi Prefecture. The incineration ash is processed for dioxin removal and water wash desalting, and then used as cement raw material. 28,000 tons of incineration ash were processed in fiscal 2003.

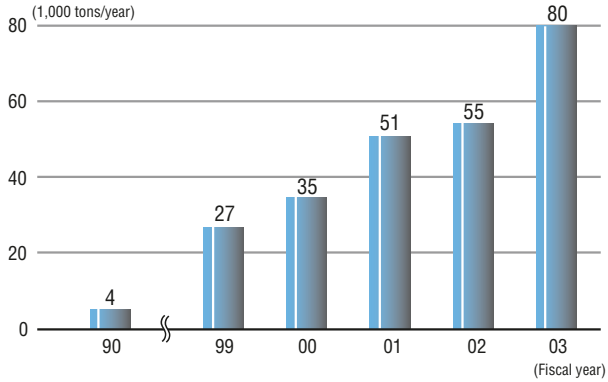
Resource & Energy Recycling Systems at Tokuyama Factory



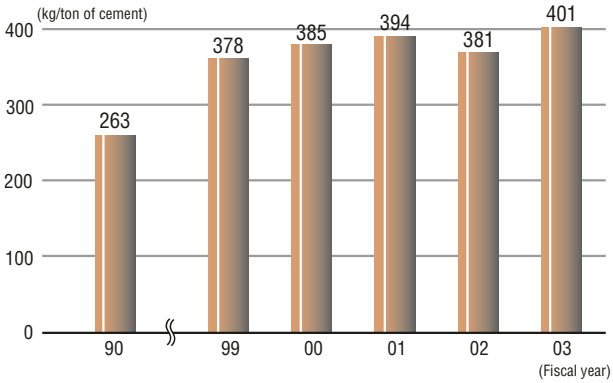
Volume of Material Recycling at Our Cement Factory



Volume of Thermal Recycling at Our Cement Factory



Unit Waste/By-products Consumption



*Material Recycling refers to the reutilization of waste and by-products as raw material substitutes. We reutilize slag, coal ash, sludge, incineration ash, etc., produced both inside and outside our company.

*Thermal Recycling refers to the reutilization of waste as fuel substitutes. We reutilize waste plastics, waste tires, etc., from both inside and outside our company.

Reducing and Recycling Waste Materials

2. Company-Wide Promotion of Recycling and Waste Management

We are working to reduce waste materials at all of our factories, and also promoting effective reutilization of the waste that is produced. We achieved a 94% effective reutilization rate in fiscal 2003, which already exceeds the target of 92% set for fiscal 2005.

Waste Management

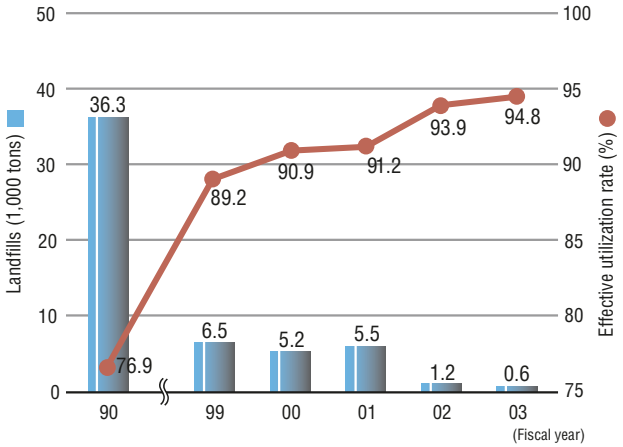
Waste materials generated in fiscal 2003 in our facilities amounted to 384,000 tons. Our efforts to aggressively pursue the means to reutilize most of such waste as raw material substitutes in our cement factory and additional recycling efforts in and out of our company enabled us to raise the effective reutilization rate to 94.8%.

Our efforts in the field of minimizing landfill waste and maximizing reutilization of such waste allowed us to achieve a 99.8% "zero-emission" rate for landfill waste.

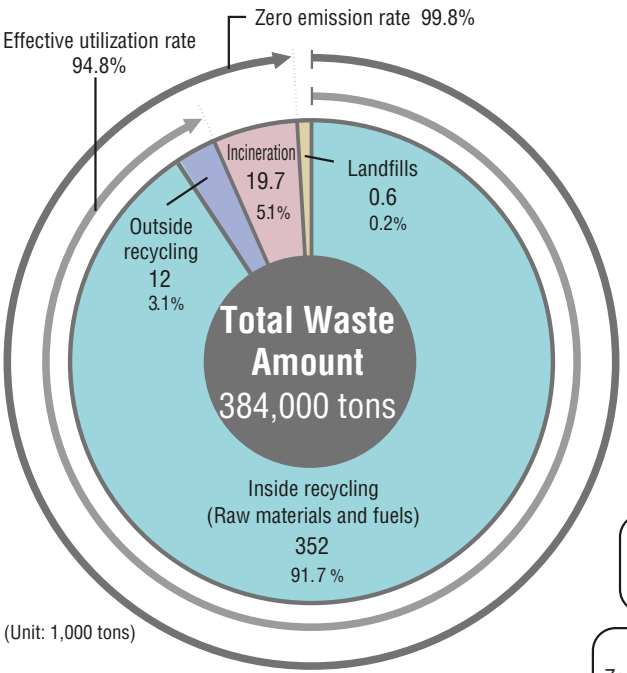
PCB* Waste Management

Both Tokuyama and our group companies appropriately store PCB containing articles such as utility transformers, capacitors, and the like, in accordance with the requirements of the "Law Concerning Special Measures against Polychlorinated Biphenyls Waste."

Effective Utilization Rate for Waste and Disposal to Landfill

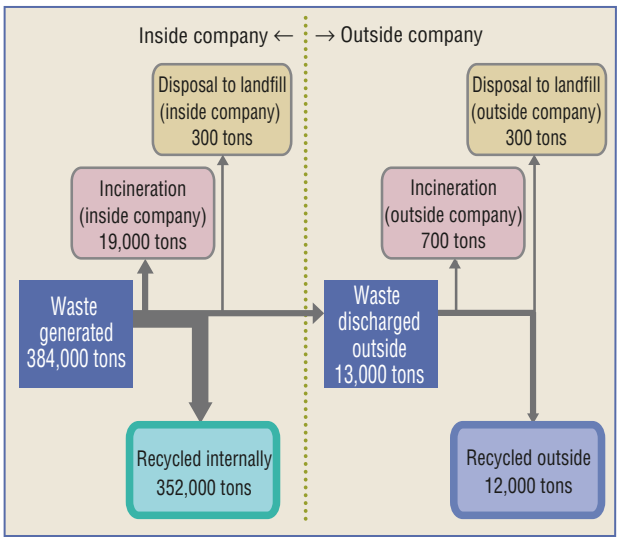


Breakdown Graph of Industrial Waste Handling in Fiscal 2003



Waste Materials Flow

*All numbers refer to fiscal 2003.



$$\text{Effective utilization rate (\%)} = \frac{\text{Recycled Volume (inside \& outside)}}{\text{Total Waste Generated}} \times 100$$

$$\text{Zero emission rate (\%)} = \left[1 - \frac{\text{Disposal to Landfill (inside \& outside)}}{\text{Total Waste Generated}}\right] \times 100$$

*PCB is an abbreviation for Polychlorinated Biphenyl. This is a chlorinated organic compound and produces dioxins when burnt at low temperatures. It is chemically stable, heat-resistant, chemical-resistant, and provides excellent electrical characteristics such as high insulation performance. It had many applications in electrical equipment, such as utility transformers, capacitors, etc., until 1972 when its production and use were banned due to the fact that it is harmful to humans. The law requires that transformers, capacitors, and the like, that are already in the market be brought to safe storage at appropriate business units.

Energy Conservation (Global Warming Prevention Measures)

We recognize it is one of our corporate social responsibilities to pursue reductions in greenhouse gas emissions to help prevent global warming. We have set ourselves high targets and our efforts continue.

Our business consumes a large amount of energy in the manufacturing process of our major products, such as caustic soda, cement, etc. Carbon dioxide, which is one such greenhouse gases, is produced by the combustion of fossil fuels. This makes us recognize the importance of pursuing global warming prevention measures, and in fact, we are striving to reduce CO_2 emissions through various energy conservation efforts.

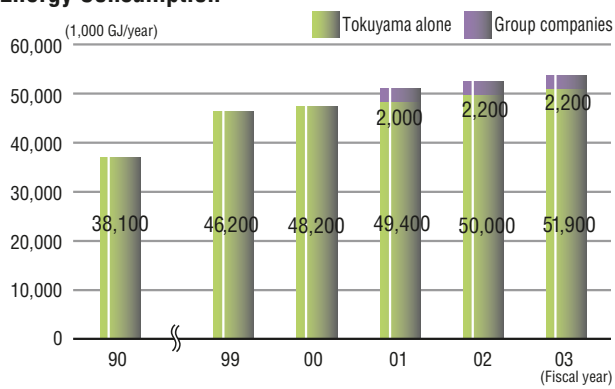
The Tokuyama Factory, which is our main factory, set a goal of achieving a 15% reduction in unit energy consumption over the 1990 level by 2005. Energy conservation efforts in fiscal 2003 included promotion of waste plastic thermal recycling at the cement factory, and a reduction of 16.7%, which well exceeds the target set for 2005, was successfully achieved. We are now working towards our next goal of 17.5% reduction over the 1990 level by 2010.

To ensure the achievement of this next goal, an energy conservation project was developed among Tokuyama's four manufacturing departments in fiscal 2003 with the aid of outside consultants. The project has yielded over 100 proposals that could allow an estimated yearly reduction of 2,100,000 GJ in energy consumption. These proposals are being reflected in all our manufacturing activities. All the above efforts are helping us restrict CO_2 emissions, despite a growth in production.

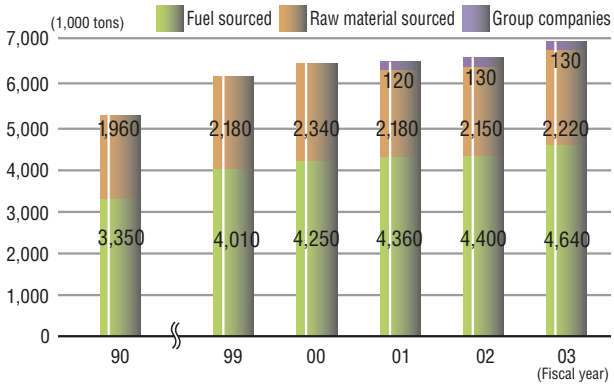
We also have completed the conversion of refrigerants in our refrigeration equipment from Freon to safe substitutes.

Interim debriefing session on Energy Conservation Projects

Energy Consumption



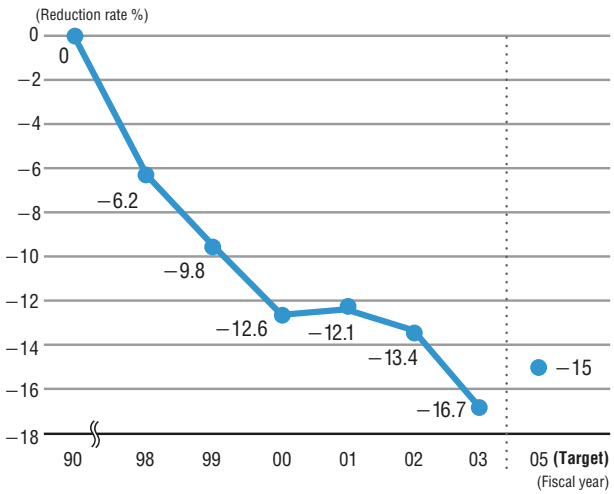
CO_2 Emissions



* Group companies are included beginning from fiscal 2001.

* The numbers in the above energy consumption and CO_2 emission charts reflect corrections made retroactively to fiscal 1990 in accordance with the revised Energy Conservation Law enforcement regulations and the Guidelines for Estimating Greenhouse Gas Emissions (draft) released by the Ministry of the Environment.

Unit Energy Consumption Index (Tokuyama Factory)



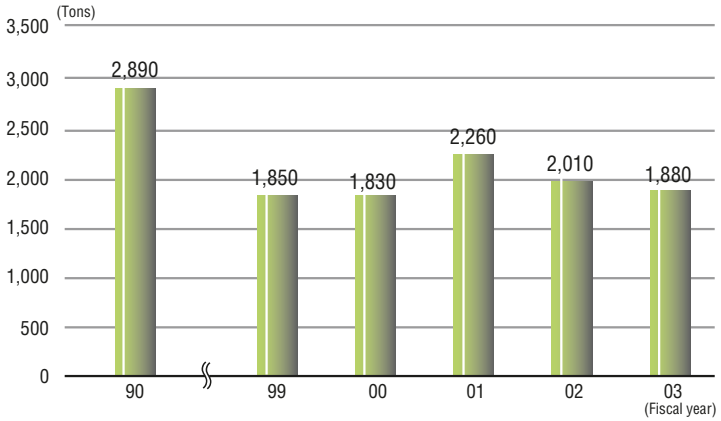
Reduction of Air and Water Pollutants

We have long been measuring the environmental loads on air and water caused by emissions and waste from our facilities, especially the cement factory and the private power plants, and are taking a variety of measures to reduce such loads.

SOx Emissions

SOx* (sulfur oxides) are emitted from such facilities as boilers, sintering furnaces, drying furnaces, etc., where heavy fuel oil or coal is combusted. In our case, most SOx emissions are from power plant boilers. To reduce SOx emissions, we have installed flue gas desulfurization equipment in each boiler system. Further, we utilize the calcium sulfate created in the desulfurization process as a cement raw material substitute.

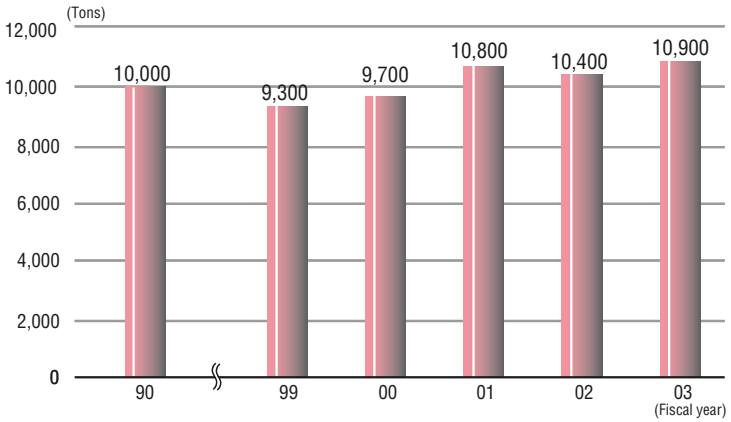
SOx Emissions



NOx Emissions

NOx* (nitrogen oxides) are also emitted from facilities such as boilers, sintering furnaces, drying furnaces, etc., where heavy fuel oil or coal is combusted. Most NOx emissions from our facilities are from power plant boilers and cement sintering furnaces. We have already installed denitration equipment and low NOx burners.

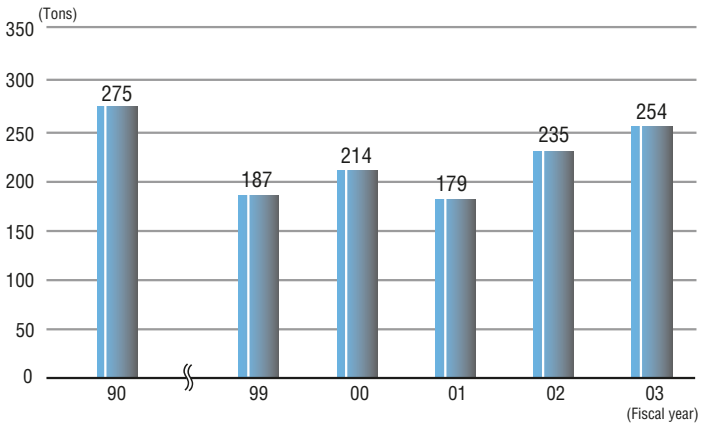
NOx Emissions



Soot and Dust Emissions

Soot and dust* are emitted in the combustion process of fuel and other materials in the power plant boilers and cement sintering furnaces. We have installed dust collecting facilities to reduce soot and dust emissions.

Soot and Dust Emissions



*SOx refer to sulfur oxides, which are produced primarily by the combustion of fossil fuels such as coal and oil. They are known to cause respiratory disorders and to be a causative agent of acid rain.

*NOx refer to nitrogen oxides, which are included in the exhaust gases from automobiles and factories. They are a contributor to photochemical smog and acid rain.

*Soot and dust refer to fine particles of soot and dust contained in the emissions from smoke stacks.

Factory Wastewater

Our Tokuyama Factory releases some 20 million tons of factory wastewater each year into public waters. We have a stringent monitoring system to keep the hydrogen-ion concentration (pH) and suspended solids within their respective limits. The wastewater from our Kashima Factory is treated at the terminal treatment facilities.

COD Release

We have a system in place to prevent water pollution. Activated sludge process equipment is in operation downstream of the process where organic constituents are involved, to reduce COD* (Chemical Oxygen Demand).

Hazardous Air Pollutants Release

Out of the 13 substances left to corporate self-management under the Air Pollution Control Law, the following four substances are included in our production: vinyl chloride, chloroform, 1,2-dichloroethane, and dichloromethane. We have set ourselves a voluntary program to achieve the necessary reductions.

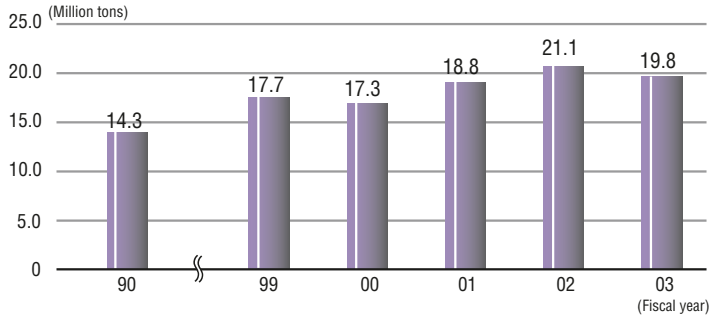
Release of Substances Governed by the PRTR Law

We compile reports on all PRTR substances and file them as necessary in accordance with the PRTR* Law, while at the same time, we pursue reductions in releasing such substances. We had 24 substances in fiscal 2003 on which we were required to make reports. The total release of those substances amounted to 98 tons.

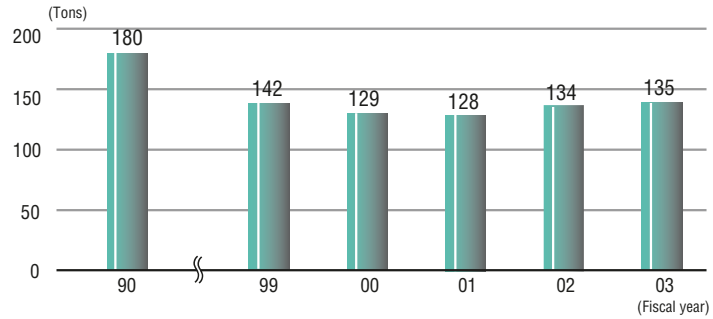
Dioxin Measures

Waste incinerators and effluent incinerators are subject to the Law Concerning Special Measures against Dioxins. We measure concentration of dioxin emissions and file reports as required by this Law.

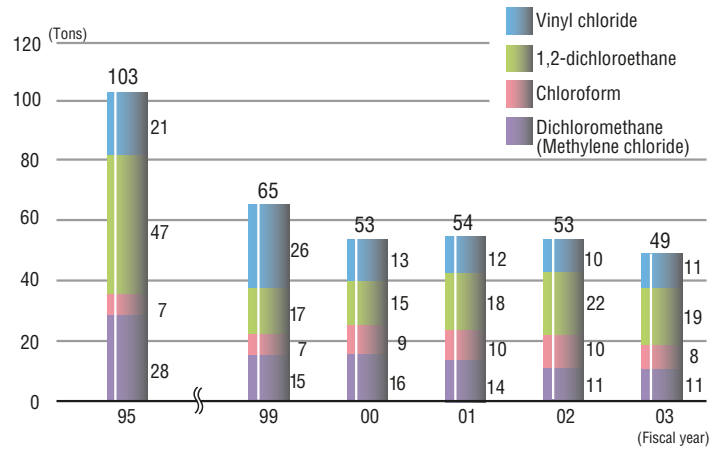
Factory Wastewater Release



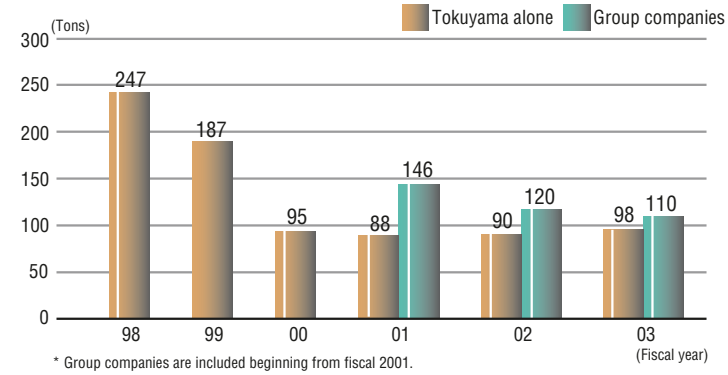
COD Release



Hazardous Air Pollutants Release



Release of Substances Governed by PRTR Law



* Group companies are included beginning from fiscal 2001.

*COD is the abbreviation for Chemical Oxygen Demand. It shows the amount of oxygen required to oxidize organic matter in the water and indicates the level of water contamination.

*PRTR, Pollutant Releases and Transfer Register, is a system for the compilation and publication of data concerning harmful chemical substances with respect to their sources, the amount of their environmental emissions, and the amount released from factory in waste materials.

Development of Environmentally-Friendly Products and Environmental Technologies

We continue to pursue the development of environmentally-friendly products and technologies for our products and waste recycling as we believe it is our corporate responsibility to focus on environmental care.

Amorphous Precipitated Silica "TOKUSIL USR/USG"

Contributes to better performance of energy-saving tires as a result of improved mileage and the minimal amount of dust generated

Amorphous precipitated silica "TOKUSIL" has long been used in a variety of applications, such as the filling and reinforcing materials for various types of rubbers, newspaper filler materials, absorbent carriers, etc. Silica has been used for some time now in "energy-saving" tires which are characterized by improved mileage performance based on reduced rolling resistance (RR) between the tire and the road surface. These tires also help improve stability on wet roads.

Based on our proprietary technology, we have developed "TOKUSIL USR," which has excellent dispersion properties when used in tire rubbers. The use of this high-dispersion silica can further reduce rolling resistance by 20% or more, which in turn can raise mileage performance by over 5%.

We also have developed environment-friendly "TOKUSIL USG," which helps minimize dust generation.

"SD-series" Photo-Developing Solutions

Efforts to establish waste solutions recovery and recycling operations

We manufacture and sell developing solutions—TMAH "SD-series"—which are used in the photolithography process for semiconductors and LCD panels. To address rising concerns about environmental conservation and social demand for promoting water contamination preventive measures and effective resource utilization, we are aiming to commercialize our waste solutions recovery and recycling operations.

We have also started waste recovery and recycling operations for our "TOKUSOH IPA SE," which is a solvent for semiconductor base materials.

High-Purity Polycrystalline Silicon

Utilized in solar cells—another way to promote energy conservation

The solar energy from sunlight falling upon the earth just for an hour is reportedly as much as the total energy consumed in one year by all human beings. This energy, if utilized through solar cells, can result in significant energy saving. Solar cells manufactured in 2003 worldwide were worth 744 MW, of which some 660 MW come from silicon solar cells. Electricity generated by solar cells is called "Clean Energy" as the process involves no emissions. Efforts are under way in many countries to promote the installation of solar cells.

We manufacture and sell high-purity polycrystalline silicon for semiconductors used for IC in electronic parts. The polycrystalline silicon is also used in solar cells, another means of supporting energy conservation.

Soil Remediation Technology (T & T Corporation)

Turning harmful substances contained in soil into harmless through proprietary technology

T & T Corporation, one of our group companies, specializes in undertaking civil engineering work, foundation improvement work, and soil remediation work. In collaboration with our Recycling and Environmental Business Department, they offer solutions to soil contamination problems by combining their civil engineering and soil remediation technologies. Once soil is contaminated, the problem may last for a long time. For this reason, soil remediation is a critical technology.

The "In-situ Remediation Process" is a process that decontaminates soil through agitated injection of several reactants which will chemically decompose harmful chemicals or make them insoluble. The process can efficiently render contaminated soil (e.g., containing volatile organic compounds) harmless to a depth of 20 meters, and also features highly accurate mixing and agitation of the chemical compounds during injection. T & T's project experience includes successful in-situ remediation of 500,000 m^3 of soils in Saitama City in 2003.

The company also offers excavation and recycling services. Contaminated soils are excavated and transported by boats to our Tokuyama Factory where they are reutilized as cement raw material substitutes.

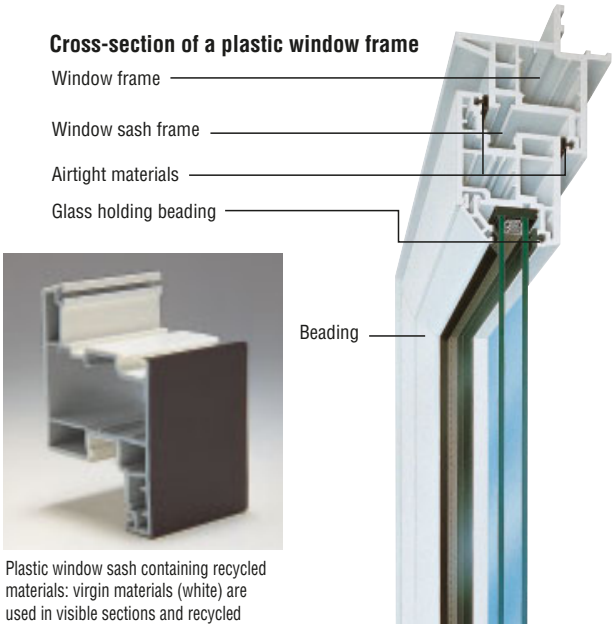
In-situ remediation work in progress in Saitama City

"Shanon" Plastic Window Sashes (Shanon Co., Ltd.)

High-performance windows contribute to home energy conservation.

Shanon Co., Ltd., one of our group companies, manufactures and sells "Shanon" plastic window sashes, which provide excellent air tightness, heat and sound insulation, and prevent moisture condensation.

With the Kyoto Protocol on preventing global warming in effect, our country is obliged to achieve a 6% reduction of greenhouse gas emissions over average 1990 levels between 2008 and 2012. Although reductions are being steadily achieved in the industrial sectors, household emissions are on the rise and need to be addressed through effective measures. In this regard, plastic window sashes are receiving attention due to their ability to conserve energy. A simulation run by the "Plastic Window Sash Promotional Committee" indicates a significant improvement in insulation efficiency or some 40% reduction in CO_2 emissions can be achieved per house if single-glazed aluminum window sashes are all replaced with double-glazed plastic window sashes fitted with low emission glass. Shanon's plastic window sashes are drawing attention as a promising material for use in the prevention of global warming.



Plastic window sash containing recycled materials: virgin materials (white) are used in visible sections and recycled materials (gray) in hidden sections

"SHANON" plastic window sash

Promoting Recycling

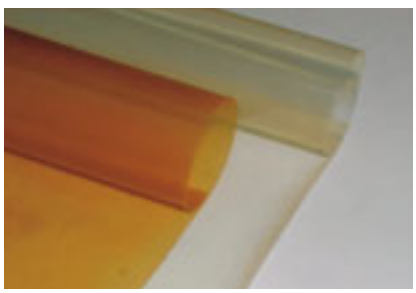
The plastic window sashes are assembled after their components are extrusion-formed and then cut to required dimensions in the assembly shop. Shanon has an effective material recycling system in place, in which the plastic remnants from the assembly shop and scrap plastic pieces from the extrusion shop are crushed and recycled as extrusion raw materials.

The volume of waste plastic from scrapped houses is expected to significantly increase after 2007. Shanon plans to accept waste windows from outside the company and recycle the plastic materials after separation from the window assemblies.

Ion-Exchange Membranes "NEOSEPTA" (ASTOM Co., Ltd.)

High performance separation techniques contribute to preventing environmental pollution.

Astom Co., Ltd., one of our group companies, is working to combat environmental problems through applying its high separation techniques developed by a combination of its ion-exchange membranes, "NEOSEPTA," and its high-performance dialyzers, "ACILYZER," which incorporate the NEOSEPTA membranes. These ion-exchange membranes selectively dialyze positive and negative ions dissociated in solution. The separation techniques have traditionally been used in salt production and the processing of foods, water, medicines, and effluent liquids. Now to deal with environmental pollution prevention, the techniques are used in wider applications, such as the separation and recovery of acids and alkalis in effluent liquids, the processing of water discharged from terminal waste treatment facilities, removal of nitrate-nitrogen from groundwater, etc. This technology is now gathering worldwide attention as another "Clean Technology" that is contributing to preventing environmental pollution.



Ion-exchange membranes "NEOSEPTA"

High-performance Dialyzer "ACILYZER"

Comprehensive Safety Management of Chemicals

We are working to ensure environmental preservation, and the safety and health of people, based on appropriate information that we acquire and analyze by stringently monitoring chemical products throughout their entire life cycle.

Data Acquisition and Analysis on the Safety of Chemical Substances

We assess the safety of chemical substances by acquiring and analyzing safety-related data. Such data is used in preparing safety information for our products, waste materials, etc.

Our activities in fiscal 2003 included an examination of chemical substances in our products and waste materials to identify any hazardous effects. This examination enabled us to review handling procedures and provide appropriate information to the people concerned.

Risk Assessment and Management of Chemicals

We monitor concentrations of chemical substances in wastewater and gas emissions as part of our comprehensive activities directed toward preventing environmental contamination.

Analyzing organics in wastewater by a liquid chromatograph mass spectrometer system

We also run simulations of concentration profiles of chemical substances to analyze their behavior in detail, as well as the behavior of nonmeasurable substances.

Risk assessments are done based on a combination of concentration data and safety data, and the assessment results are reflected in enhancing our equipment safety measures and handling procedures, and in educating the people involved in handling products and waste. These efforts naturally help us improve our product safety and provide accurate information to our customers.

Assessment of Products and Labeling

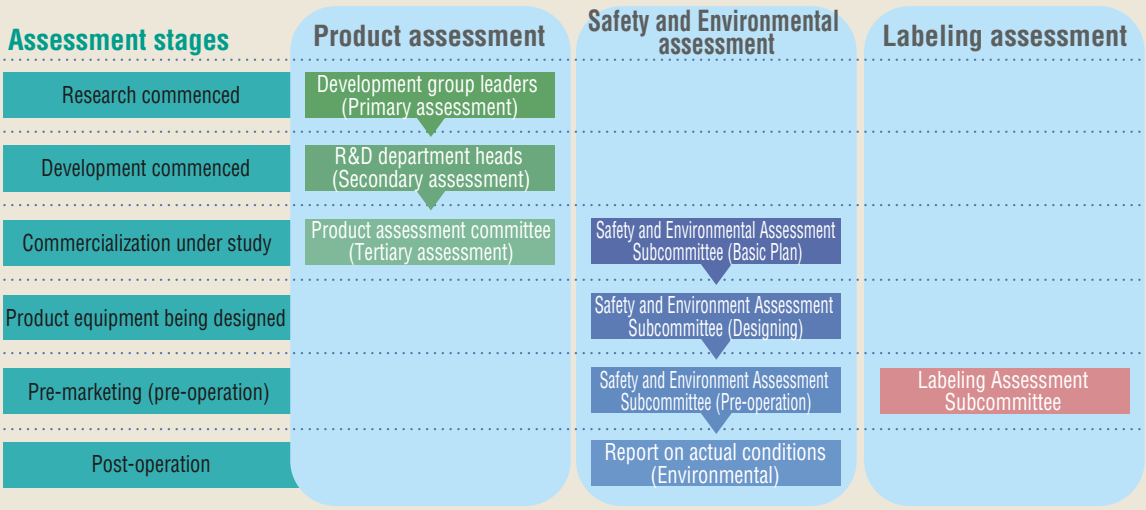
We appropriately assess the safety of both the chemical products and equipment units that we manufacture, in stages from research and development through commercialization. We made 30 assessments of this kind in fiscal 2003.

We also carry out labeling assessments of our catalogues, MSDSs,* and other technical documents. We carried out 475 assessments of this type in fiscal 2003. Labeling of our products, prototypes and sample products are all assessed and any inappropriate labeling is corrected.

Provision of Information on Our Chemical Products

We provide an MSDS for all our products and prototypes to our customers and distribution agents.

Assessment Flow Diagram for Ensuring Safety and Environmental Preservation



*MSDS is the abbreviation for Material Safety Data Sheet. It is a document that contains information such as the name of the chemical material, appropriate safety and emergency measures required, etc., related to that material, and is intended to ensure safe handling by providing information about any hazards related with the specific material.

We have so far issued about 340 MSDSs for our products. Of these, the MSDSs for top 15 items of our products, recording high amounts of transportation, are made available on our Web site (in Japanese only) so that they can be accessed for reference at any time in the event of an incident in transportation.

We also have each driver carry a yellow card* that is prepared with emergency instructions for use if an incident occurs during transportation. The MSDSs and yellow cards on our products and waste materials are also shown on our intranet Web site so that this type of safety-related information can be shared.

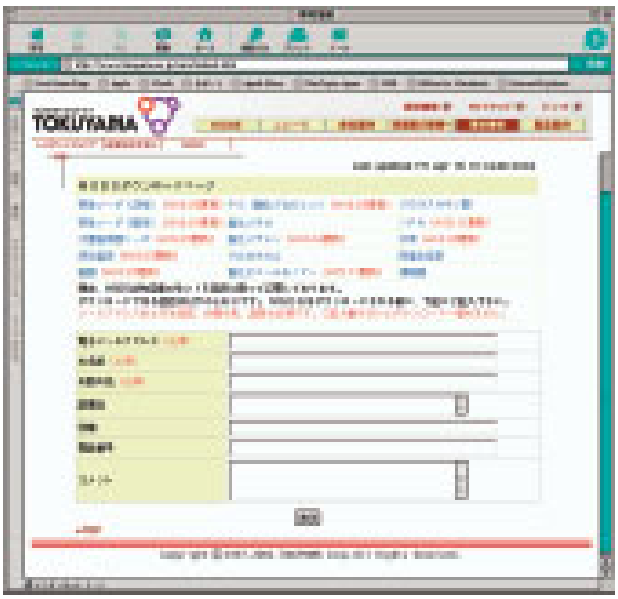
Safety Management of Waste Materials

Waste materials are handled in the same way as our products. We develop the necessary MSDSs for waste materials and distribute them to waste handling contractors and distribution agents to ensure safe handling and transportation of such waste materials. Also each driver is made to carry a yellow card prepared for the waste materials in case an incident occurs during transportation. We have so far issued 65 MSDSs for waste materials.

Participation in HPV Program

We actively participate in the HPV* program that is being promoted through the framework of OECD (Organization for Economic Co-operation and Development), and are proceeding with our safety assessments of HPV chemicals.

We participate in HPV programs for 18 chemicals. Our company is the leader of an international consortium for the TMAH (Tetramethyl ammonium hydroxide) HPV, which follows our previous commitment as leader of the Calcium Chloride HPV. TMAH is a chemical that is used in the form of a developing solution used in the photolithography process for semiconductors and LCD panels, and its role is becoming ever more important. We are proceeding with our RC activities through our safety assessments in the TMAH HPV Program.



MSDSs for our major products are also available on our Web site (in Japanese only)

Promoting Safety and Environmental Management in the Distribution Process

● Providing Our Distribution Agents with Guidance and Education on Safety Management

We regularly hold local safety meetings with our nation-wide distribution agents to whom we consign product transportation services. We also conduct distribution safety inspections to raise the safety awareness of the people concerned. Within the premises of our Tokuyama Factory, our safety specialists make continual inspections and visit cargo carriers in their berths, providing safety guidance as necessary.

We also have a range of emergency measures in place. These include the requirement that each truck driver carries a yellow card and appropriate emergency tools, enabling suitable and speedy actions based on the emergency measures given on the card in case an incident occurs during land transportation. An emergency network and related organization also form part of our safety procedures.

● Distribution Risk Assessment

We conduct risk assessments on the transportation of hazardous materials. (Means of product transport, safety of trucking routes, suitability of transport containers, emergency measures to be taken in the event of an accident, etc., are all examined at Transport Safety Review Meetings). We provide training for dealing with accidents during the transportation. We also make safety assessments on any new distribution facilities that are planned to be built.

● Crisis Management

To deal with potential crises in distribution, we review our emergency response system criteria and ensure that disaster prevention equipment is always ready for use.

● Environmental Preservation Measures and Energy Conservation

As part of environmental preservation measures, we provide thorough instructions to trucking companies with regard to meeting the controlled exhaust emissions from diesel-powered vehicles. We also encourage energy conservation efforts through the introduction of a mileage log management system.

Monthly factory premises safety patrols (Tokuyama Factory)

*The "**Yellow Card**" is the common name of a card prepared for emergency use, which explains to the truck driver or his representative, fire crews, or police what to do in the event of an accident involving chemicals or high pressure gases during transportation.

***HPV** is the abbreviation for High Production Volume, and refers to a program whereby worldwide chemical companies and related industries undertake continuous safety assessments and compile data on those priority chemicals that are produced in quantities of more than 1,000 tons per year in at least two countries.

Process Safety and Disaster Prevention/ Occupational Health and Safety

We are developing activities aimed at achieving zero accidents, based on the spirit of our basic safety posture that "Safety is the foundation of all business activities, and is the first step toward living in harmony with society."

Commitment to Safety and Disaster Prevention

Comprehensive Disaster Prevention Activities

We are well-equipped with disaster prevention materials and equipment, including chemical fire engines, high-elevation water cannon trucks, ambulances, oil barriers, etc. We also have organized a self-defense disaster prevention unit, which carries out annual comprehensive, joint disaster prevention drills incorporating a variety of mock simulations of accidents and disasters.

Safety Activities Aimed at Achieving Zero Accidents

Our safety activities include workplace safety meetings, safety patrols, hazard prediction activities, 5-S activities, hazard labeling, improvement of signs, verbal safety checks (voicing the name and pointing at the item to be checked), safety education, etc. These activities are all based on our commitment to "creating a workplace where nothing is overlooked" in order to prevent any unsafe actions or conditions, and promoting the concept of "think-about-safety" before starting an activity.

Acquisition of Voluntary Safety Certification based on the High Pressure Gas Control Law

We are continuing our efforts to add more facilities to the list of Voluntary Safety Certification that are subject to the High Pressure Gas Control Law. We have been certified as an "Administrator of Accredited Safety Inspections" for our IPA (Isopropyl Alcohol) production facilities, and are working to extend the certification list.

Commitment to Voluntary Maintenance

We are committed to safe plant operations by promoting voluntary maintenance activities in our operational management sector and by reinforcing the specialized maintenance technologies in our facilities management sector. These efforts have enabled us to steadily reduce the number of sudden failures. Our cement factory is running a TPM* program and has won the TPM Excellence Award.

Safety and Environmental Inspection

We conduct safety and environmental inspections throughout all our factories to identify the status of Safety and Health Management. If the inspection identifies any incidents of nonconformance, these are pointed out and necessary guidance given for corrective actions.

Zero-Accidents Record Established

Tokuyama Factory has established a Category II zero-accidents record (8.1 million hours for the chemical industry). Kashima Factory has had zero accidents for 18 years since its start-up. Tsukuba Research Laboratory can also boast of the fact of zero accidents for the 14 years since its establishment. The Company's three key sites are all making efforts to continue their excellent safety performance.

Established Category II zero-accidents record

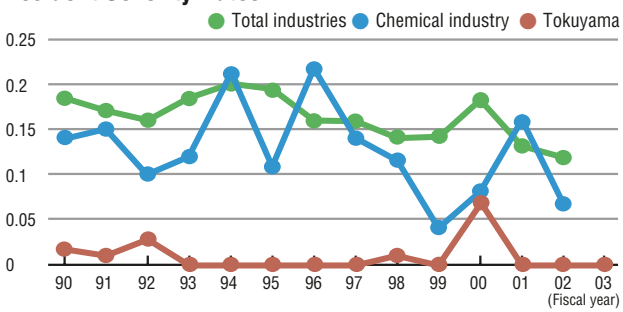
Our investment for process safety in fiscal 2003 amounted to some 200 million yen and includes items of emergency equipment for use in the event of a disaster, such as emergency power supply units, weather monitoring systems, and so on.

Commitment to Occupational Health and Safety

Safety and Health Management System Now Operative

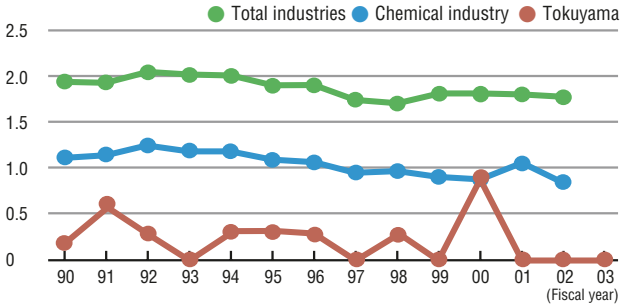
Each of our factories has implemented a Safety and Health Management System and commenced its operation in fiscal 2003, in accordance with the *JCIA New Occupational Health and Safety Guidelines*, issued by the Japan Chemical Industry Association. This system provides the means to voluntarily and continually perform health and safety management by repeating the PDCA (Plan-Do-Check-Act) cycle. It is intended to help improve the occupational health and safety standards by minimizing the latent risks of industrial accidents, creating pleasant work environments and enhancing workers' health. The *JCIA New Occupational Health and Safety Guidelines* were prepared for chemical companies in accordance with the guidelines of the Ministry of Health, Labor and Welfare, and OHSAS 18001 included in the International Standards.

Accident Severity Rates*



* **Accident Severity Rate** refers to the number of work days lost in 1000 cumulative work hours, and represents the severity of industrial accidents.

Rates of Lost Work Time Injuries*



* **Rate of Lost Work Time Injuries** refers to the number of workers away from work due to workplace injuries in 1 million cumulative work hours, and represents the frequency of industrial accidents.

* **TPM** is an abbreviation for Total Productive Maintenance. It is intended for achieving zero-losses with the participation of all employees, in pursuit of maximized production efficiencies, by implementing systems that prevent any losses due to accidents, defective products, equipment failures, etc.

Our expenditures for workplace environmental measures in fiscal 2003 totaled 46 million yen as part of our efforts concerning occupational health and safety.

Safety Education

To promote safety awareness and knowledge among our company employees and subcontractors, we are providing in-house workshop, safety meetings, hazard prediction training, factory visitor instructions, and so on.

Pleasant Work Environments

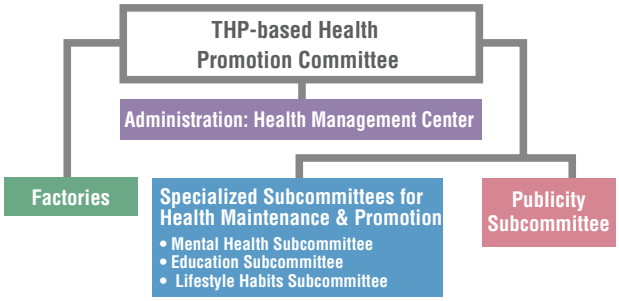
Aiming to create pleasant working conditions, we continue to monitor the workplace environments where specified chemicals and organic solutions are being handled, and continue to improve the work procedures and equipment involved. These efforts have enabled us to maintain all of our worksites in Control Category I,* as verified by our workplace environment inspections.

Health Promotion Based on THP (Total Health Promotion)

We have a regular health checkup system to ensure the health of all our employees.

We have also organized a "THP-based Health Promotion Committee" in line with the THP Guidelines recommended by the Ministry of Health, Labor and Welfare, under which a variety of health promotion programs are being conducted. Specialized subcommittees for health maintenance and promotion include the Mental Heath Subcommittee, the Education Subcommittee, the Lifestyle Habits Subcommittee, and the Publicity Subcommittee. Based on individual's health check results, nutrition- and exercise-related counseling schedules are worked out aiming at improving the individual's overall physical condition. As part of our company-wide systematic health promotion activities, the committee members appointed at the respective business units conduct recreational activities and test the exercise ability of each individual.

THP-based Activity System



Rambling tour of Tokyo's Tsukiji-Odaiba in 2003

Environmental Communications

We actively provide information and seek interactive communication with stakeholders to keep them apprised of Tokuyama's environmental activities.

Environmental Report

Since our first publication in 1997, we have prepared an annual Environmental Report (available in both Japanese and English) to keep all concerned apprised of the corporate approach to environmental activities and provide a summary of our year's environmental activities. The reports are also available on our Web site.

Report for 2003

Environment-related Information on Our Web Site

Environmental Information Main Page

We provide an "Environmental Information" directory on our Web site and put out a variety of detailed information covering "Responsible Care," "Waste Material Recycling Business," "MSDS (Material Safety Data Sheet)," etc. (in Japanese only)

Participation in Environmental Events

In support of the Yamaguchi Iki-iki EcoFair (Sponsored by Yamaguchi Prefecture, October 11–12, 2003), we had a booth to present our environmental activities, including Waste Material Recycling in Cement Kilns, and deepened exchanges with citizens.

Tokuyama booth. Visitors were given original digital-photo post cards and balloons.

* **Control Category I** refers to a condition in which an atmospheric concentration of hazardous substances is below the control level in most part (over 95%) of the unit work area. There are three classes of Control Category: Category I, II, and III, of which I is the most desirable.

Tokuyama Factory

Executive Managing Director and
Tokuyama Factory General Manager
Hisami Tanimoto

Location: 1-1, Mikage-cho, Shunan City, Yamaguchi Prefecture
Number of Employees: 1,584
Area of Factory : Total 1,430,000 m², including
Tokuyama Plant, Nanyo Plant and Higashi Plant
Main Products
Cement, inorganic and organic chemical products, polycrystalline silicon, silica, vinyl chloride, etc.
Features
Facing the Tokuyama bay, the factory is conveniently located for sea transportation of raw materials and products. The cement factory contributes to recycling waste materials and by-products. Electric power and steam are supplied from our own power generation plant.

Commitment to Environmental Preservation

- The factory defines its safety and environmental policy based on the company-wide policy, and then sets objectives and goals based on specific factory policies. Employees participate in activities directed toward achieving these objectives and goals.
- A total of six neighboring companies, including several of our group companies, have acquired ISO 14001 certification and are running environmental management systems.
- We are working to reduce environmental loads. Concerning PRTR substances in particular, we have been working to minimize their releases and/or emissions for many years. In fiscal 2003, we implemented measures on releasing vinyl chloride, 1,2-dichloroethane, etc., from the vinyl chloride plant; however, partly due to the failure of the incinerator, we regretfully had to allow the release amount to slightly increase. We will continue to systematically pursue the means to reduce releases of such substances.

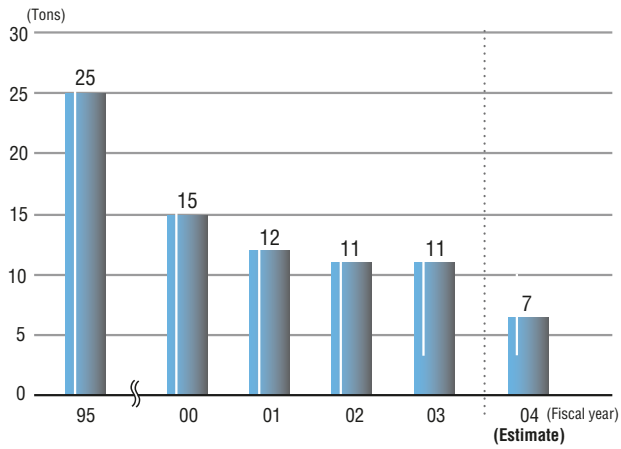
Release and Transfer of PRTR Substances Sorted by Item (FY 2003)*

(in tons** except dioxins, in mg-TEQ)

Name of substance	Legally-specified substance number	Amount released				Amount transferred
		To atmosphere	To public water systems	To soils	Subtotal	
Cresol	67	0.0	23.5	0.0	23.5	0.0
1,2-dichloroethane	116	18.9	0.0	0.0	18.9	0.1
Chloromethane (Methyl chloride)	96	15.6	0.0	0.0	15.6	0.0
Chloroethylene (Vinyl chloride)	77	10.8	0.0	0.0	10.8	0.0
Dichloromethane (Methylene chloride)	145	10.5	0.0	0.0	10.5	0.2
Chloroform	95	7.5	0.0	0.0	7.5	0.0
Toluene	227	3.8	0.0	0.0	3.8	96.1
1,2-dichloropropane	135	3.4	0.0	0.0	3.4	187.2
1,2-epoxypropane (Propylene oxide)	56	0.6	0.0	0.0	0.6	2.3
Carbon tetrachloride	112	0.4	0.0	0.0	0.4	0.0
Copper and its water-soluble salts	207	0.0	0.0	0.0	0.0	0.0
Hydrazine	253	0.0	0.0	0.0	0.0	0.0
Hydrogen fluoride	283	0.0	0.0	0.0	0.0	0.0
Benzene	299	0.0	0.0	0.0	0.0	0.0
Boron and its compounds	304	0.0	0.0	0.0	0.0	0.0
Dioxins	179	(33.8)	(15.2)	(0.0)	(49.0)	(0.0)
Total		**71.5**	**23.5**	**0.0**	**95.0**	**285.9**

* Scope of survey includes PRTR-law specified substances with an amount handled of more than 1 ton per year, and dioxins.
** While the PRTR Law says the amount of release shall be given in kilograms to two significant figures, the amount in this report is given in tons, rounded to the nearest 1/10 ton (dioxins in mg-TEQ).

Release of Dichloromethane (Methylene chloride)



An Eco Station where waste materials are sorted

• As part of our effort to reduce waste materials, we reutilize the majority of waste materials produced by the factory as cement raw material substitutes. We built a new waste storage facility (Eco Station) in fiscal 2003, designed to facilitate the sorting process for recycling, which helped to significantly reduce waste disposal to landfills.

Commitment to Process Safety

• We have organized an independent disaster prevention unit, and conduct a comprehensive joint disaster drill once a year based on a variety of simulated accidents and disasters.

• We are promoting acquisition of Voluntary Safety Certification based on the High Pressure Gas Control Law, and have so far been certified as an "Administrator of Accredited Safety Inspection" for two units of our facilities. We have proceeded with our preparations in fiscal 2003 to be certified for a further ten units.

Joint disaster drill

Commitment to Occupational Health and Safety

• We commenced operating the Health and Safety Management System in fiscal 2003 to help us prevent industrial accidents.

• We have established an "Accident Prevention Conference" jointly with our subcontractors, and are developing "subcontractor-integrated activities" for the prevention of accidents and/or disasters at work. By reinforcing safety patrols and safety meetings, we are improving information-sharing and safety awareness among all employees.

• To ensure safety, we emphasize the following major topics: "Creating a workplace where nothing is overlooked" to prevent any unsafe conditions or actions; the concept of "think-about-safety" before starting actions; and "Visible Safety," which helps to uncover potential workplace hazards. Specific activities include hazard prediction activities such as mutual alertness promotion, hazard labeling, improvement of signs, verbal safety checks by voicing the name and pointing at the item to be checked; hazard prediction activities such as KY, information exchange on "close call" experiences at work; safety education and training, and safety and environmental assessments.

All the above efforts enabled Tokuyama Factory to establish for the first time a Category II zero-accidents record (8.1 million hours for the chemical industry), as defined by the Ministry of Health, Labor and Welfare in December 2003.

Coexistence with Local Communities

• Shunan City is developing its "Clean Network Promotion Activities" to improve the local environment. Tokuyama Factory participates in these activities and carries out a "Cleanup Campaign" once a month to clean around its vicinity.

• Each year we are also active participants in forestry maintenance activities, called "Activities for Community-Forest-Water Interaction," organized to help preserve the forests in the community area. One hundred and forty people participated in fiscal 2003.

• We made presentations on "Our Commitment to Environmental Preservation" during the Responsible Care briefing to community people, aimed at increasing community awareness of the environmental preservation efforts being made by the companies in the Shunan District. After the presentations, we hosted a tour of our Tokuyama Factory on behalf of the industrial complex in the area. It followed the first one hosted last year and was very useful to deepen the mutual understanding. We intend to continue this type of dialogues with the local communities.

• We aim at being a company open to society. Anyone interested can visit us for a factory tour by making an application in advance. We had some 2,800 visitors to our Tokuyama Factory in fiscal 2003, taking the tour of the cement plant where the waste recycling facilities are in operation.

• Out of seven environmental complaints in fiscal 2003, two were considered attributable to our Tokuyama operations. We investigated the causes and implemented the necessary measures for the equipment involved.

Kashima Factory

Location: 26 Sunayama, Hasaki-machi, Kashima-gun, Ibaraki Prefecture
Number of Employees: 87 **Area of Factory Premises:** 101,000 m²

Kashima Factory is located within the Hasaki Industrial Complex that forms a part of the Kashima Coastal Industrial Region. It comprises Tokuyama's Kashima Factory, Kashima Plant of Tokuyama Dental Corporation, and Kashima Works of A&T Corporation. They all belong to the Tokuyama Group and are engaged in manufacturing specialty chemical products that contribute to human health.

Kashima Factory General Manager
Shigeki Yuasa

Tokuyama's Kashima Factory
Bulk pharmaceuticals (x-ray contrast agents, stomach and duodenal ulcer treatment drugs); optical materials (plastic lens monomers, light modulating materials, hard coat solutions); raw materials for electronic components; metal washing solutions

Kashima Plant of Tokuyama Dental Corporation
Dental materials (restorative materials, adhesives, denture relining materials, impression materials, dental stone, implant materials)

Kashima Works of A&T Corporation
Diagnostic reagents (electrolyte analysis reagents, glucose analysis reagents, polyamine analysis reagents)

Commitment to Environmental Preservation

- Eleven PRTR substances are used in Kashima Factory. Based on the ISO 14001 Environmental Management System, we are working on minimizing the environmental loads caused by those substances.
- Our studies to date in reducing hazardous air pollutants has enabled us to switch the processing solutions from dichloromethane to water in part of the overall process, and thus to reduce the atmospheric emissions of dichloromethane (at Kashima Plant, Tokuyama Dental Corp.).
- Our waste water management focused on ethylene glycol of which the release amount was the largest. We achieved an 80% reduction in the ethylene glycol release to the public waste water system.
- 90% of the industrial waste from Kashima Factory are waste oils, which are partially recovered by distilling. We managed to recover about 24% of the waste oils in fiscal 2003. When we send them to consignment incineration, we still ask for maximum thermal recycling, rather than direct incineration. Such efforts have resulted in a recycling rate increase from 47% to 60%.

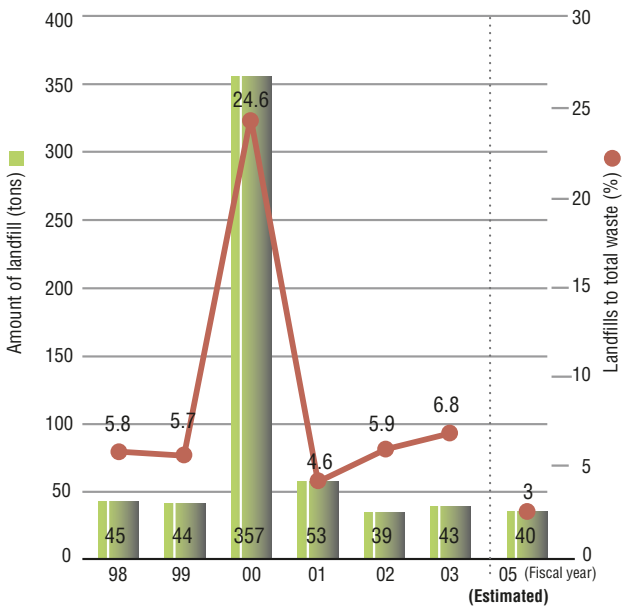
Release and Transfer of PRTR Substances Sorted by Item (FY 2003)* Tokuyama's Kashima Factory

(in tons**)

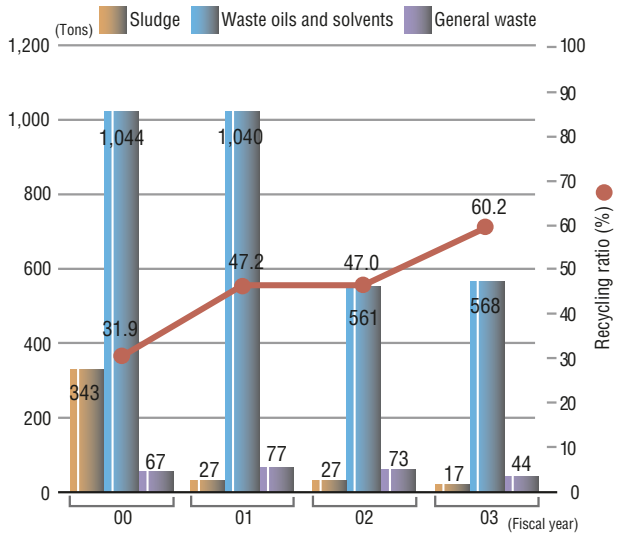
Name of substance	Legally-specified substance number	Amount released				Amount transferred
		To atmosphere	To public water systems	To soils	Sub-total	
Toluene	227	1.4	0.5	0.0	1.9	17.2
Ethylene glycol	43	0.0	0.5	0.0	0.5	1.4
Chloroform	95	0.3	0.2	0.0	0.5	0.8
Dichloromethane (Methylene chloride)	145	0.3	0.0	0.0	0.3	1.9
Acetonitrile	12	0.0	0.0	0.0	0.0	2.5
N,N-dimethylformamide	172	0.0	0.0	0.0	0.0	12.4
1,4-dioxane	113	0.0	0.0	0.0	0.0	0.1
2-vinylpyridine	256	0.0	0.0	0.0	0.0	0.2
Methacrylic acid	314	0.0	0.0	0.0	0.0	0.0
2,3-epoxypropyl methacrylate	316	0.0	0.0	0.0	0.0	0.0
α-methylstyrene	335	0.0	0.0	0.0	0.0	0.0
Total		**2.0**	**1.2**	**0.0**	**3.2**	**36.5**

* Scope of survey includes PRTR-law specified substances with an amount handled of more than 1 ton per year.
** While the PRTR Law says the amount of release shall be given in kilograms to two significant figures, the amount in this report is given in tons, rounded to the nearest 1/10 ton.

Transition of Yearly Final Disposal to Landfill
(total of 3 companies)



Amount of Waste Materials and Recycling Ratio
(total of 3 companies)



- We are now close to resolving problems concerning the recycling of particular activated carbon waste and metals. This should help further reduce the final waste disposal to landfill (sludge and stabilized wastes). We estimate the disposal to landfill in fiscal 2004 will be reduced to 40 tons or less from 43 tons in fiscal 2003.
- We check noise levels, odors, and rain water on a monthly basis to ensure that they meet the levels required by the Pollution Prevention Agreement.
- We made inspection visits to six industrial waste handling contractors in fiscal 2003 and confirmed that waste was being handled in an appropriate manner.

Commitment to Process Safety

Under the 2003 slogan of "Respect the Work Rules to Protect Yourself," we continued to improve dangerous areas in workplaces by providing safety patrols, and patrols by managers and industrial physicians. Thanks to such efforts, Kashima Factory has continued its zero-accidents record for the 18 years since its establishment (as of end of March, 2004).

We also carry out comprehensive disaster drills, fire extinguisher training, and water discharge exercises each year, to be prepared for any emergency.

Commitment to Occupational Health and Safety

To raise employees' health and safety awareness, the Health and Safety Committee is running systematic activities such as hazard prediction training, participation in safety workshops, acquisition of official licenses, study meetings, etc.

Safety and environmental assessments are always carried out during the prototype manufacturing of new products or for changes in manufacturing processes.

Number of Safety & Environmental Assessments
(Tokuyama's Kashima Factory)

Fiscal year	1999	2000	2001	2002	2003
Number of Safety & Environmental Assessments	1	14	11	9	9

We are also working to improve our risk management by introducing the Safety and Health Management System to the manufacturing departments. The workplace environmental quality has always been favorably maintained within Control Category I.

Workplace Environmental Analysis Results (total of 3 companies)

Fiscal year	1999			2000			2001			2002			2003		
Control category	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
Number of analyses	21	0	0	31	1	0	34	2	0	36	0	0	18	0	0

Coexistence with Local Communities

- We make May 30 a "Zero Refuse Day," and carry out coordinated cleaning work inside and outside Kashima Factory every year.
- As a member of the Hasaki District Companies Network (Hasakiren), we undertook odor patrols and coordinated cleaning around the industrial complex.
- Being the manager of Kashima-district RC Activity Network in fiscal 2004, we will actively participate in the Responsible Care community dialogues. We are determined to continue promoting the environmental management activities to strengthen harmonious coexistence with local communities.
- There was a complaint from local residents to Hasakiren that offensive odors were experienced in the northeast district of the complex. Although we eventually found that we were not responsible for that incident, our General Affairs Section took the role of coordinating with the parties concerned.
- There were three questions from the waste material handling contractors, which were all properly dealt with through adequate communications.

Fire extinguisher training

Water discharge exercises

Coordinated cleaning work

Group Participation

We are encouraging all Tokuyama group companies to participate in Responsible Care activities so that we can act in a unified way.

Supporting Group Companies in Their RC Activities

We believe we should jointly address Responsible Care activities with our group companies. To provide support for their activities, we have exchanged a memorandum of agreement on RC management with the respective group companies that are engaged in production activities at home and aboard.

We assess overall RC activities by reviewing the RC activity data of the group companies, such as their environmental loads, safety management indicators, etc., and also by making safety and environmental inspections for several companies on a yearly basis.

We share information on relevant laws and regulations among all the group companies, and also help them acquire ISO 14001 and ISO 9001 certification.

ISO 9001 and ISO 14001 Acquisition Status for 10 Group Companies

Company name	ISO 9001	ISO 14001
Sun·Tox Co., Ltd.	●	●
Shanon Co., Ltd.	●	—
Tohoku Shanon Co., Ltd.	●	●
A&T Corporation	●	●
Figaro Engineering Inc.	●	—
Tokuyama Dental Corporation	●	●
Tokuyama Siltech Co., Ltd.	●	●
Sun Arrow Chemical Co., Ltd.	—	●
ASTOM Co., Ltd.	—	●
Shin Dai-ichi Vinyl Corporation	—	●

● Certified ● Included as a group site

Shin Dai-ichi Vinyl Corporation

Company overview:

Date established: July 1, 1995
Shareholders: Tokuyama Corp. 71.0%, ZEON Corp. 14.5%, Sumitomo Chemical Co. 14.5%
Head office: Tokuyama Bldg. 4-5, Nishi-Shinbashi 1-chome, Minato-ku, Tokyo
Factories:
Chiba Factory
5-1 Anegasakikaigan, Ichihara City, Chiba Prefecture
Tokuyama Factory
1-1 Harumicho, Shunan City, Yamaguchi Prefecture
Takaoka Factory
630 Ogino, Takaoka City, Toyama Prefecture
Ehime Factory
10-1 Kikumotocho 1-chome, Niihama City, Ehime Prefecture
President: Nobutada Maeda
Capital: JPY 8,000 million
Main business: Manufacture and sale of vinyl chloride resins

Company's RC Activities

The company was founded in 1995 by Tokuyama Corp., Sumitomo Chemical Co., and ZEON Corp. to manufacture and sell vinyl chloride resins.

The company took over the manufacturing facilities that had been owned by the investing companies and, therefore, its factories remain at their previous sites; i.e., Chiba Factory in Chiba Pref., Takaoka Factory in Toyama Pref., Ehime Factory in Ehime Pref., and Tokuyama Factory in Yamaguchi Pref. Manufacturing is undertaken at these factories on a consignment basis.

RC activities involved with the manufacturing processes, such as process safety, and occupational health and safety and environmental issues, are delegated to the respective factories. The headquarters receive the performance results of such activities, and release the relevant information to the factories to promote RC activities between the manufacturing and sales divisions.

Efforts to Reduce Vinyl Chloride Releases

Vinyl chloride, which is a raw material of our vinyl chloride resins, is one of the self-managed substances designated by the Air Pollution Control Law.

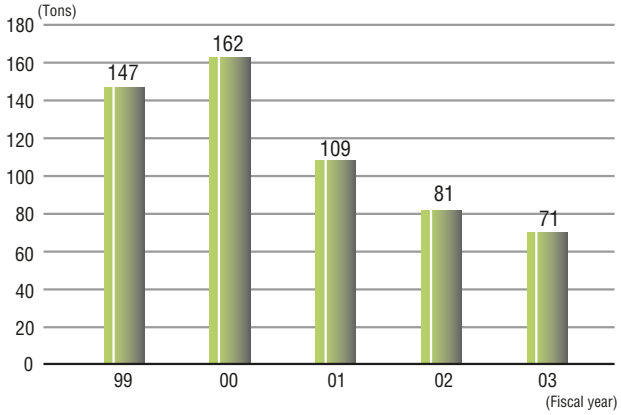
As a member of the Vinyl Environmental Council, we are participating in the 3-year Project to Reduce Atmospheric Emissions. Our efforts in reducing the release of vinyl chloride include thorough operational management, recovery of unconverted gases, switching to closed-type polymerization tanks, waste gas incineration, and so forth.

Management under ISO 14001

Each factory has incorporated an environmental management system into their overall systems, and has acquired ISO 14001 certification within its scope of activity.

The respective factories have set themselves environmental goals, toward which they are conducting appropriate environmental management activities.

Vinyl Chloride Release



We have worked to improve the quality of our activities by undertaking the Responsible Care Verification process.

The Japan Responsible Care Council (JRCC) instituted its "RC Verification System" in April 2002 to verify corporate RC activities. The RC Verification System is intended to help JRCC member companies improve the quality and credibility of their RC activities. We were the 9th company to apply and went through the verification process in December 2003.

The verification in our case covered four Responsible Care Codes:* Management System, Process Safety, Occupational Health and Safety, and Environmental Preservation. Verification is performed by assessing, on a scale of 1 to 5, the data recorded in observations and questionnaire responses. Following the verification process, we received an assessment report with a set of comments. We achieved a very favorably score of 4.3 on a scale of 1 to 5.

We also received some useful recommendations from JRCC, which we intend to incorporate in future RC activities.

* In total, there are seven codes for RC verification: Management System; Process Safety; Occupational Health and Safety; Environmental Preservation; Distribution Safety; Chemical and Product Safety; and Community Dialogue.

Letter of comments from the RC verification

Meeting during the RC verification process

Tokuyama RC Activities—Historical Overview

July 1991	Established Global Environmental Issues Committee
March 1993	Established RC Administration Committee, Instituted voluntary plan for Total Management of Environment, Safety and Quality
April 1994	Acquired ISO 9002 certification for High-Purity Isopropyl Alcohol
June	Improved product warranty systems, such as product and labeling assessments
April 1995	Became a member of the Japan Responsible Care Council
September 1997	Issued RC Report (First edition)
May	Acquired ISO 9001 certification for Cement Manufacturing
April 1998	Acquired ISO 9001 certification for Dental Materials Manufacturing
December	Acquired ISO 9001 and 9002 certifications for aluminum nitride and Functional Powders Manufacturing; Tokuyama Factory was certified to ISO 14001
January 1999	Kashima Factory was certified to ISO 14001
June	Acquired ISO 9002 certification for Chemical Products, Polypropylene, Films, etc.
December	Set up Ecological Management Initiative Department. Acquired ISO 9002 certification for polycrystalline silicon, organic solutions, etc.
August 2000	Created Recycling and Environmental Business Department
April 2001	Established Yamaguchi Eco-Tech Co., Ltd.
April 2002	Acquired ISO 9002 certification for vinyl chloride monomer and polyvinyl chloride
June	Kashima Factory won the Ibaraki Prefecture award in recognition of it being an "Earth-Friendly Company"
March 2003	Received the award of distinction in "Resource Recycling Technologies and Systems" from the Director-General of Industrial Science and Technology Policy and Environment Bureau, Ministry of Economy, Trade and Industry
April	Updated certification to ISO 9001:2000; company's sales sector was newly certified
December	Underwent the Responsible Care verification process. Tokuyama Factory achieved a Category II zero-accidents record (8.1 million hours for the chemical industry) as defined by the Ministry of Health, Labor and Welfare.

We welcome your comments on this report at our Web site address as follows: (in Japanese only)

http//www.tokuyama.co.jp/care/enquette.html

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Next issue: Scheduled for September 2005