



Kuraray Environmental and Social Report 2003

A Message from the President



Yasuaki Wakui

Yasuaki Wakui
Representative Director and President

Recent years have seen an increase in the number of initiatives arising in response to the growing threat to the global environment. Although negotiations on the effectuation of the Kyoto Protocol for the preservation of global warming have stalled, there have been several substantial moves made in Japan, including a revision of the Energy Conservation Law and amendment of the Principles for the Promotion of Global Warming Countermeasures.

At the outset of the 21st century — often dubbed the environment century — the Kuraray Group formulated its “G-21” medium-term business plan, according to which the Group actively engages in environmental preservation and expands the scope of environment-related business to become an “eco-friendly enterprise with unique technology.” In more concrete terms, we have incorporated the Medium-term Environmental Plan in the “G-21,” and identified significant issues, including the reduction of emissions of chemical substances specified by the Pollutant Release and Transfer Resister Law, increased efficiency in the utilization of industrial waste, reduction in the volume of industrial waste being inefficiently processed externally, and increased energy efficiency. We are making steady progress in achieving the targets we have set for fiscal 2005. In fiscal 2002, we accelerated the drive to increase energy efficiency, convert boiler fuels, and reduce our volume of coal consumption through use of biomass energy, in an effort to reduce CO₂ emissions, the primary cause of global warming.

One of the founding philosophies of the Company is to contribute to the conservation of the natural environment and the enhancement of quality of life through the development of original products that can substitute for natural products. Deeply aware of our responsibility to society at large as a corporate citizen, we have maintained constant engagement in a number of philanthropic activities, among them assistance to community medical services via affiliated hospitals, support for scientific education through sponsorship of the Chemistry Class for Boys and Girls, and cooperation in community and volunteer activities.

To ensure a better understanding of these aspects of the Group, we have changed the title of our Environmental Activities Report to Environmental and Social Report, and included more information on our activities directed to fulfilling our responsibility to society at large. I sincerely hope that the information contained here will assist you in better understanding the Kuraray Group.

C O N T E N T S

Editorial Policy

Reporting Scope

The Kuraray Group

"The Kuraray Group" refers to Kuraray Co., Ltd. and its 24 major affiliated companies in Japan.

Kuraray Co., Ltd.	Kyosei Chemical Co., Ltd.
Kuraray Engineering Co., Ltd.	Kuraray Medical Inc.
Kuraray Chemical Co., Ltd.	Kuraray Saijo Co., Ltd.
Kuraray Trading Co., Ltd.	Kuraray Tamashima Co., Ltd.
Kuraray Plastics Co., Ltd.	Kuraray Techno Nakajo Co., Ltd.
Kuraray Fudosan Co., Ltd.	Kuraray Techno Kashima Co., Ltd.
Kuraray Living Co., Ltd.	Kuraray Techno Okayama Co., Ltd.
Kuraray Techno Co., Ltd.	Kuraray Techno Kurashiki Co., Ltd.
Techno Soft Co., Ltd.	Kuraray Techno Saijo Co., Ltd.
Kuraray Interior Co., Ltd.	Kuraray Okayama Spinning Co., Ltd.
Magictape Co., Ltd.	Kuraflex Co., Ltd.
Kuraray Saijo Kiko Co., Ltd.	Nihonkai Acetylene Co., Ltd.
Kuraray Niigata Kasei Co., Ltd.	

Consolidated subsidiaries
Equity-method subsidiaries

As of March 31, 2003, there are 40 consolidated and 10 equity-method based subsidiaries.

For purposes of this report, "Kuraray" refers to Kuraray Co., Ltd. and the 15 affiliated companies occupying the same premises ().

Reporting Period

Fiscal Year 2002 (ended March 31, 2003)

This report also includes selected data on our environmental activities for Fiscal 2003.

Editorial Notes

We have tried to include as much data as possible on our social activities in this issue of the Kuraray Environmental and Social Report.

The Environmental Report 2002 included a number of new items of information which, to our regret, struck some readers as overly technical. In editing this report, we have tried to keep the text as clear and non-technical as possible, so that it might appeal to a wider group of readers. In preparing the report, we referred to the guideline by the Ministry of the Environment (Fiscal 2000 edition) and the GRI Sustainability Reporting Guideline 2002.

Details of performance data can be found at the end of the report.

All product names italicized are trademarks of Kuraray Co., Ltd.

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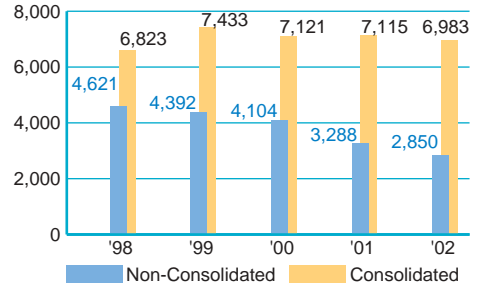
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Corporate Outline

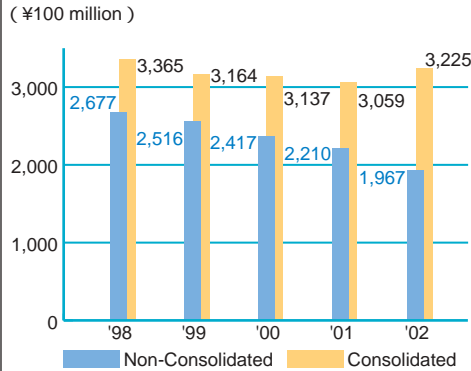
Company Name: Kuraray Co., Ltd.
 Capital: 89.0 billion yen (as of March 31, 2003)
 Principal Products: Functional resins, fine chemicals, man-made leather, medical products, synthetic fibers
 Head Offices: Osaka, Tokyo
 Domestic Operations: Okayama, Kurashiki, Saijo, Nakajo, Kashima, Tsukuba
 Overseas Operations: USA, Germany, Belgium, Singapore, China

Number of Employees

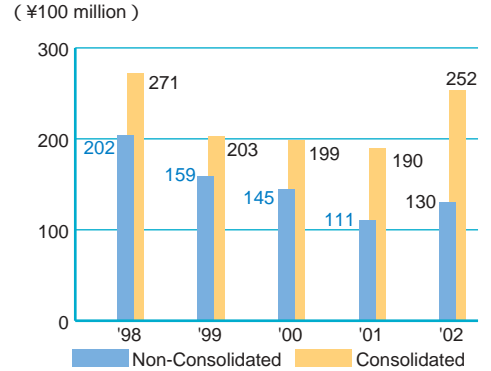


Financial Highlights

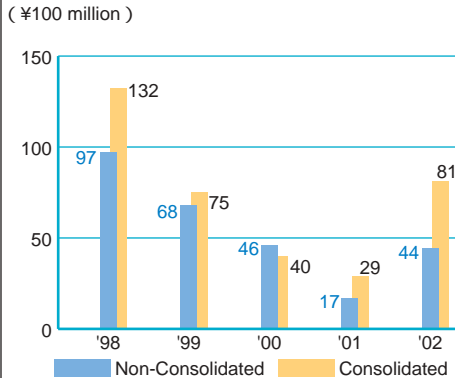
Net Sales



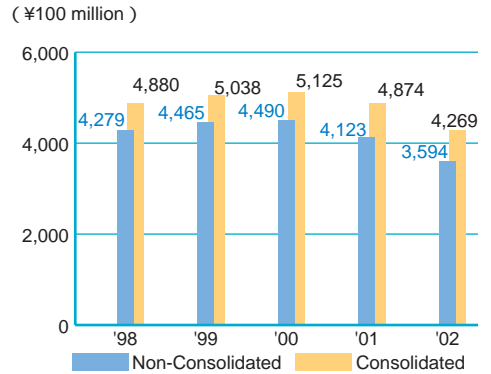
Operating Income



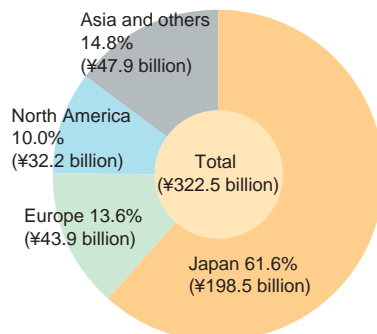
Net Income



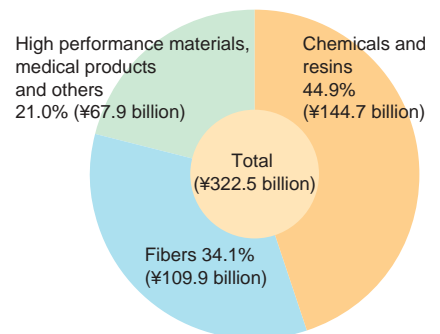
Total Assets



Sales by Geographic Segment (consolidated, by customer location)



Sales by Business Segment (consolidated)



Management Philosophy

Corporate Philosophy

Respect for individuals
Cooperation in shared goals
Creation of values

Guidelines for Action

Act on customers' needs.
Act on ideas in the working place.
Act on your own initiative.

Corporate Mission

We in the Kuraray Group are committed to opening new fields of business using pioneering technology and contributing to an improved natural environment and quality of life.

Corporate Mission Established in April 2003

Since its founding in 1926, Kuraray has transformed itself from a domestic fiber manufacturer to a global group of chemical enterprises. We could say that the Company has been allowed to live by society which accepts its existence. It is important to ask ourselves again why the Kuraray Group exists and what contribution it can make, in modest recognition of this fact. "Corporate Mission", a permanent "mission" to be performed by the Kuraray Group in society, has been established on the basis of such thinking.

Natural Environment

For the purpose of harmonious coexistence of human beings and nature, we are committed to making efforts to minimize negative impact on nature caused by our business activities and to promote the development of businesses and products that improve the environment.

Quality of Life

We will endeavor to make people's lives healthier, safer and more comfortable.

Principles for Business Conduct

We will develop and provide products and services, giving full consideration to safety.

We will conduct businesses in a free, fair and transparent manner.

We will maintain good communications and build a sound relationship with society.

We will strive to preserve and improve the global environment and to secure safety and health.

We will respect intellectual properties including trade secrets and control information properly.

Management Structure

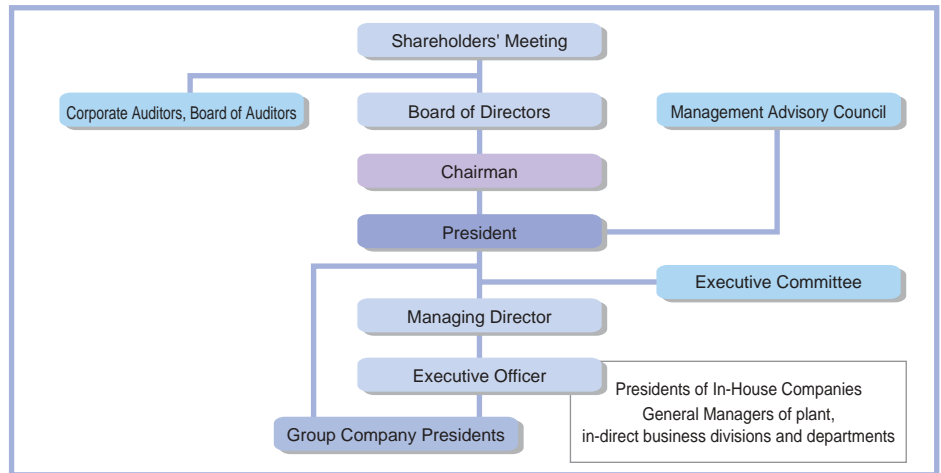
Corporate Governance

The Kuraray Group is in the process of augmenting its corporate governance structure in order to increase fairness and transparency in management. In fiscal 2002, we have strengthened our corporate auditor system for monitoring management and we introduced an in-house company system that gives the president of each company greater decision-making authority and performance accountability. These measures are designed to speed up management procedures and to separate decision-making from supervision in management overall.

To buttress this framework, we plan to implement several reforms to our management structures during Fiscal 2003:

- ① **Increase in corporate auditors:** One auditor has been added, bringing their number from four to five; three of these come from outside the Company, to facilitate closer monitoring of management.
- ② **Management Advisory Council:** Comprised of the Company's chairman, an advisor, a representative of the Board of Auditors, and two outside members. The Council will advise the president on management policies and business plans for the Group, as well as consider matters related to the retirement of the president, candidates for his/her successor, and the president's compensation.
- ③ **Introduction of an executive officer system:** We have introduced an executive officer system to ensure deeper penetration of our in-house company system. The executive officers (term: 1 year) will be assigned to manage the performance of business operations, assuring individual accountability and responsibility for profits. This reduces the maximum number of directors to ten (from thirty); the term of office for directors has been shortened from two years to one. These measures will promote agility in decision-making.

Management Structure



Guided by the Principles for Business Conduct, the Kuraray Group engages in fair and transparent business activities of high moral caliber. We have established an In-house Ethics Committee (1998) and a Kuraray Employee Counseling Room (2001) to ensure the early detection of any problematic activity in the Company. In February 2003, the president published the Compliance Declaration, and all employees are required to carry on their person a Compliance Card, to remind them of their obligation to comply with the law and to elevate corporate ethics. In order to mitigate any potential danger from within, we are strengthening our internal administration, including the Kuraray Group Risk Conference, to facilitate appropriate preemptive actions.

Compliance Guideline

Principles for Business Conduct



Compliance Declaration

Trans-Department Organizations

- In-house Ethics Committee:** discusses the Group's activities in light of the Management Philosophy.
- Philanthropy and Ecology Committee:** designs basic policies for philanthropy and ecology.
- Kuraray Group Risk Management Conference:** investigates potential risks to the Group and designs countermeasures.
- Kuraray Employee Counseling Room:** provides consultation on issues not easily resolved within the workplace.

Compliance

Compliance Declaration

We will comply with the law and the Principles for Business Conduct. We will give precedence to the law and the Principles for Business Conduct over corporate profits. We will strive to prevent any act that goes against the law or the Principles for Business Conduct, or betrays the trust that society has placed in us.

Compliance Card

A card displaying the Principles for Business Conduct and our Declaration of Compliance

Environment Preservation and Safety Guidelines

Basic Approach to Responsible Care



Responsible Care®

Responsible Care

Responsible Care calls for companies that manufacture or handle chemicals to commit themselves to taking measures of their own initiative to prevent hazards to the environment, safety, or health during all stages of each chemical's lifecycle — from product development through manufacturing, use, and disposal.

Kuraray Group Action Guidelines for the Global Environment

① Basic approach to global environmental issues

In keeping with the two Principles for Business Conduct that state, "We will maintain good communication and build a sound relationship with society" and "We will strive to preserve and improve the global environment," our basic approach to global environmental issues is to fulfill our responsibilities for the well-being of future generations through corporate activities that are in harmony with the global environment and the local community.

② Basic approach to disaster prevention and occupational safety

We will take extraordinary measures company-wide to prevent and contain any damage from disasters that could affect the community, including explosions, fires, and leakage of hazardous substances.

③ Basic approach to product safety

We will endeavor to contribute to creating an affluent, comfortable society by meeting customer needs through the supply of safe and reliable products.

Management Philosophy and Guidelines for Environmental Preservation



Basic Guideline

We will fulfill our responsibility to future generations through corporate operations that are in harmony with the global environment and the local community.

In order to realize our basic guideline, Kuraray will undertake the following activities:

- ① We will assign the highest priority to the environment and safety in the course of corporate operations.
- ② We will work to improve the global environment and ensure its sustainability.
- ③ We will develop technologies and products that contribute to the goal of improving the global environment.

Action Principles

- ① Continual reduction of emissions of specified chemical substances into the environment
- ② Contribution to the prevention of global warming through the promotion of energy conservation
- ③ Promotion of conservation, reuse, and recycling of resources
- ④ Development and supply of technologies for improving the environment through products with low environmental impact
- ⑤ Utilization of environmentally friendly products
- ⑥ Public disclosure of environmental information and dialog with the community
- ⑦ Raising the level of environmental consciousness and environmental management

Medium-Term Environmental Plan

Significant Issues

Numerical Targets

Activities at Model Plants

In keeping with our ideal of an "Eco-Friendly Enterprise with Unique Technology," in February 2001 the Kuraray Group formulated its Medium-Term Environmental Plan as part of our active engagement in environmental preservation. In the following year, we clearly defined the goal of "zero waste emissions," and will set a numerical target for CO₂ emissions during fiscal 2003.

1. Efforts to Reduce Environmental Impact

- ① Reduction of the volume of specified chemical substances released into the environment
- ② Reduction of CO₂ emissions
- ③ Achievement of the goal of zero waste emissions

2. Expansion of efforts for both "green" purchasing and "green" distribution

3. Quantified measurements of the environmental impact of Kuraray products

- ① Implementation of Life Cycle Assessment (LCA)
- ② Introduction of the Environmental Label Type III

4. Development and supply of environmentally friendly products

5. Strengthening and improvement of communications

- ① Greater disclosure, with attention to Corporate Social Responsibility (CSR)
- ② Enhanced environmental accounting
- ③ Strengthened risk-related communication with host communities

The Kuraray Group Zero Waste Emissions

Stage 1: Reduce the final amount of waste destined for landfill to less than 1% of the total waste generated at a site by expediting efficient use of waste

Stage 2: Reduce the final amount of unutilized waste from our sites destined for landfill or simply incinerated to zero %

Numerical Targets (target year: fiscal 2005) *versus fiscal 1999 levels

- ① Reduction of 90% in emissions, including substances specified by the PRTR Law
- ② Reduction of 90% in volume of industrial waste inefficiently processed externally (target: 1,500 tons/year)
- ③ Increase of 20 points or more in waste utilization efficiency (60% to 80%)
- ④ Increase of 6% in energy efficiency (1% increase/year)

We have designated model plants for each issue in order to proceed efficiently in carrying out our initiatives.

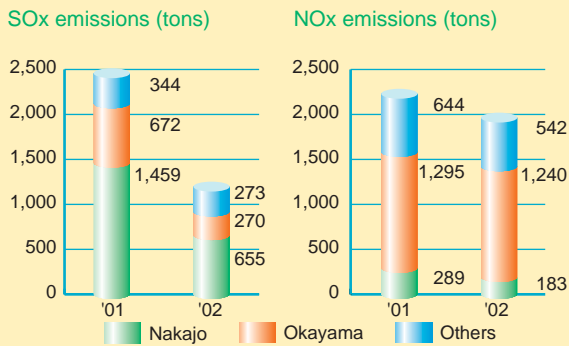
Sites		Activities in Fiscal 2002
Okayama	Model plant for zero emissions	<ul style="list-style-type: none"> • Promotion of thermal recycling and efficient use of waste (ratio of efficient use: 87%, up 2ppt YoY) • Studies on reducing surplus sludge to zero • Consideration of what should be processed at resource recycling waste treatment facilities
	Model plant for energy conservation	<ul style="list-style-type: none"> • Performance improvements in a generation turbine • Recovery of hot water and heat at large plants • Simulated process analysis to locate themes • Campaign to improve efficiency of large equipment, etc.
Kurashiki	Model plant for active promotion of LCA	<ul style="list-style-type: none"> • Designation of eco-indicators, collection of LCI* data • Conduct of LCA for a model theme, sharing of case studies within the Company • Spreading of LCA techniques to other business divisions • Feedback to R&D
Kuraray Tamashima	Model plant for ecology-related business promotion	<ul style="list-style-type: none"> • Expansion of use of waste plastics as boiler fuel (28% of total fuel, up 5ppt YoY) • Inaugural use of biomass fuels
Nakajo	Model plant for early adoption of regulations on total wastewater COD mass	<ul style="list-style-type: none"> • Reduction of BOD in wastewater to below 15ppm by strengthening operation controls at each plant • Examination of capabilities of wastewater treatment facilities using PVA gel • Basic study of treatment of wastewater from the poval resin production process
Kashima	Model plant for active response to the PRTR Law.	<ul style="list-style-type: none"> • Installation of isoprene emission reduction devices • Consideration of efficient removal devices, presentation of cases to other divisions
Kuraray Saijo	Model plant for zero emissions and energy conservation	<ul style="list-style-type: none"> • Zero surplus-sludge operations (two years)

* LCI (Life Cycle Inventory)

To sort out the data on the environmental impact caused by input of materials and energy, as well as output product and emissions at each stage of the product lifecycle

Reduction in SOx and NOx Emissions

Since the Kuraray Group's fiscal 2001 emissions of SOx and NOx were high, at 2,475 tons and 2,228 tons, respectively, we converted from heavy oil to natural gas for power generation boiler fuel at the Nakajo Plant, and improved smoke treatment for the power generation boilers at the Okayama Plant. As a result, SOx emissions for Fiscal 2002 registered a significant drop: down 55% year-on-year at the Nakajo Plant and 60% year-on-year at the Okayama Plant, with total emissions down 52% (1,198 tons). NOx emissions decreased 37% year-on-year at the Nakajo Plant, and 12% (1,965 tons) for the Group overall. (P.17)



Expansion of the Water Treatment Business

In Fiscal 2002, we succeeded in developing a large-pored membrane that efficiently removes cryptosporidium (pathogenic protozoa) in the water supply. A water purification plant in Hamura City, Tokyo, decided to use the product in their membrane filtration facilities – one of the largest in Japan. The large-pored membrane not only increases the volume of water purified per filter area, but also saves energy and costs, because it only requires a difference in the water levels at the purification plant to filter water, and so does away with the need for a booster pump.



Large-pored membrane

Biomass Power Generation

At Kuraray Tamashima, we are recycling thermal energy by using waste plastics gathered from both inside and outside the Kuraray Group as a fuel. In August 2002, we started use of biomass resources like construction debris (timber). Since biomass resources can be recycled naturally, it is possible to reduce CO₂ emissions by converting them into fossil fuels. We plan to raise the percentage of biomass resources to 20% of the total energy at Kuraray Tamashima in the future.



In recognition of the reduction and efficient use of industrial waste, reduction of use of coal fuels for boilers and its initiatives to reduce CO₂ emissions, Kuraray Tamashima's Utility Section was presented the Reduce-Reuse-Recycle Promotion Council Chairman's Award by the Kansai Economic Federation.

Green Partnership

The Kuraray Group is working with its suppliers and customers in energetically promoting the purchase and supply of eco-friendly materials. One of the initiatives in this area is an offer to be a Green Partner with Sony Corporation. Following audits of our Okayama Plant, Nakajo Plant and Kuraray Saijo, we signed the agreement, and intend to expand the "Green" chain through cooperation with our materials suppliers and customers.

Green Partner

A system for purchasing introduced by Sony as a way to substantially accelerate compliance with the RoHS Directive slated to go into effect in the EU.

RoHS Directive

After July 2006, no electric or electrical appliances, etc. containing specified chemical substances (heavy metals, etc.) will be allowed as exports to EU member countries.

Assessment by Outside Organs

In Fiscal 2002, our environmental management was assessed by the Sustainable Management Rating Institute – their first attempt at this kind of assessment. We are listed among the issues under supervision (total 603) for the "FTSE 4 Good," an internationally renowned stock index of socially responsible investments (SRI).



Highlights of Kuraray's Initiatives

We are striving to achieve the action targets in the Medium-Term Environmental Plan.

Progress with Numerical Targets

We set numerical targets for fiscal 2005 in the Medium-Term Environmental Plan. In Fiscal 2002, we achieved our target for waste utilization efficiency plan, well ahead of the original time-frame for Fiscal 2005.

Progress with Numerical Targets

Targets		Unit	FY99 (base year)	
Reduction of 90% in emissions, including substances specified by the PRTR Law	Kuraray	All covered substances	tons	4,913(100%)
		Substances covered by PRTR Law		1,816
	Affiliates	All covered substances	tons	1,055(100%)
		Substances covered by PRTR Law		612
	Total	All covered substances	tons	5,968(100%)
		Substances covered by PRTR Law		2,428
Reduction of 90% in volume of industrial waste inefficiently processed externally	Kuraray	1,000 tons		9.6
	Affiliates			5.0
	Total			14.6(100%)
Increase of 20 points or more in waste utilization efficiency (60% to 80%)	Kuraray	%		63
	Affiliates			16
	Total			60
Increase of 6% in energy efficiency (1% increase/year)	Kuraray	%		-

Environmental Accounting

As part of our initiative to report environmental preservation activities, in 1999 we started publishing our investments in environmental preservation, and in 2000 our expenses for environmental preservation. In order to implement environmental accounting, we referred to the guidelines by the Ministry of the Environment. In Fiscal 2002, we developed an Environmental Accounting System, and put it into use the following year.

Environmental Preservation Costs (millions yen)

Category		Investments	Expenses	Descriptions
Costs within operating sites	Anti-pollution costs	449	2,284	Operating cost for environmental equipment Preventing chemical substance emissions
	Global environment preservation costs	591	168	Improving generator turbine blades Increasing generator turbine efficiency
	Resource recycling costs	16	894	Turning waste plastics into solid fuels, reducing and recycling industrial waste
	Total	1,056	3,346	
Upstream and downstream costs		-	156	Collecting and reusing packaging materials, improving container packaging
Administration costs		-	310	ISO14001, environmental monitoring, environmental education
R&D costs		-	477	Developing eco-friendly products
Community activity costs		-	3	Forestation, beautification, communicating environmental data to local residents
Environmental damage recovery costs		-	194	Imposed costs related to SOx emissions
Total		1,056	4,486	

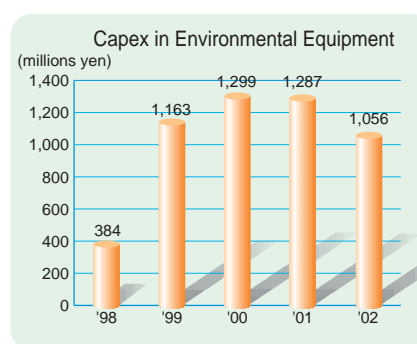
Total investment during the term: ¥17.4 billion
(calculation based on the scope of environmental accounting)

R&D expenditures during the term: ¥10.6 billion
(calculation based on the scope of environmental accounting)

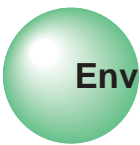
FY02	FY05 (targets)	Major activities in FY02	Pages
3,594 (73%)	492 (10%)	Installing vent condensers for the vinyl acetate tank Discontinuing products that produce methanol Installing absorbers for exhaust collection on the isoprene tank	21
869	182		
478 (45%)	105 (10%)		
63	61		
4,072 (68%)	597 (10%)		
932	243	Promoting recycling of waste through more rigorous separation Promoting thermal recycling by using waste plastics as fuel Promoting recycling of materials through sample waste exhibits	23
3.9	1.0		
2.0	0.5		
5.9 (40%)	1.5 (10%)		
82	-		
64	-	Improving performance of generator turbines by remodeling blades Collection and reuse of hot water and heat	19
81	80		
5.0	6		

Environmental Preservation Effect

	Category	Unit	FY01	FY02	Difference	Pages
Anti-pollution	SOx emissions	1,000 tons	2.4	1.2	1.2	17, 18
	NOx emissions	1,000 tons	2.1	1.9	0.2	
	Soot and dust	tons	150	68	82	
	COD emissions	tons	760	753	7	
Global environment preservation	Energy consumption	1,000 kL (crude oil equivalent)	460	456	4	19
	CO ₂ emissions	1,000 tons CO ₂	1,360	1,400	40	
Resource recycling	Externally processed waste	1,000 tons	4.5	3.9	0.6	23
	Total wastewater emissions	million m ³	80.4	78.1	2.3	



- Preconditions for assembling environmental accounting
Period: April 1, 2002 – March 31, 2003
Scope: Kuraray
- Basis for calculation
 - ① Depreciation: Straight-line method
 - ② Allocation method for multiple costs: In principle, only costs 100% for environmental preservation are charged, however some expenses are divided proportionally.
- Calculation method for environmental preservation effect
Calculations are made by comparison with total environmental impact during the previous year. Figures are not adjusted by production volume, but represent a simple comparison to those of the previous year.
- Calculation method for economic effects brought about by environmental preservation programs
The economic benefits comprise income from recycling, etc. Costs for environmental preservation are subtracted from the benefits.



Environmental Management

We are improving and strengthening the environmental management system to enable a more active approach to environmental initiatives.

Organization

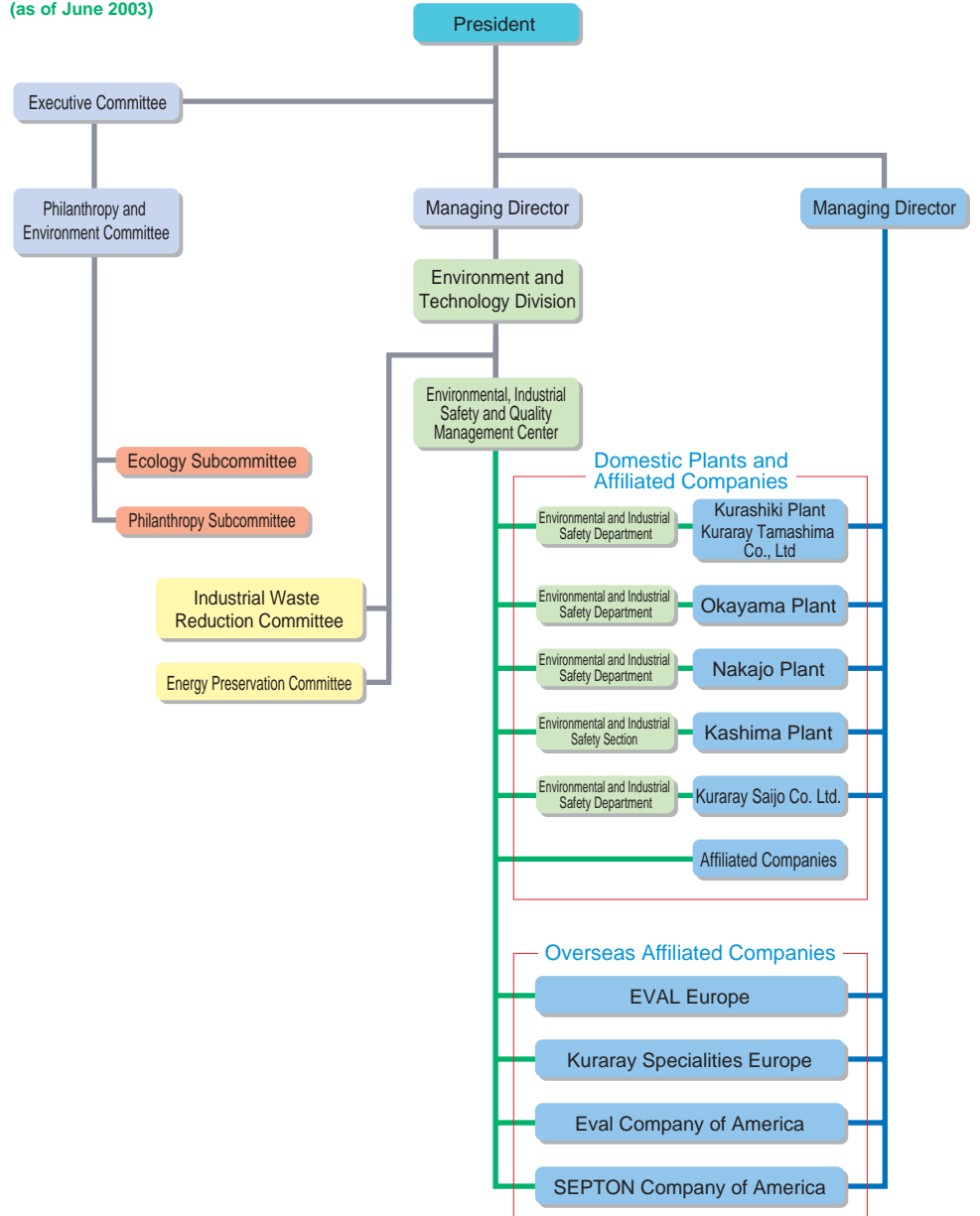
Environmental Management based on Responsible Care Initiatives

Kuraray has participated in the Japan Responsible Care Council since it was established in 1995. We are striving to devise improved measures to preserve the environment and ensure safety, and to share these measures throughout the entire Kuraray Group.

To tackle environmental preservation initiatives from mid- and long-term viewpoints, we have placed a Philanthropy and Environment Committee (and Ecology Subcommittee, Philanthropy Subcommittee) under the Executive Committee, and have created an Environmental, Industrial Safety and Quality Management Center (Osaka, Tokyo) and Environmental and Industrial Safety Departments or Sections (plants), which specialize exclusively in environmental preservation and industrial safety. In fiscal 2000, to achieve the numerical targets in the Mid-Term Environmental Plan, we established two cross-organizational committees (Industrial Waste Reduction Committee and Energy Preservation Committee).

In fiscal 2002, we expanded the scope of the environmental management structure to cover overseas affiliated companies, and began to collect data on their performance, which may be found in the data pages at the end of this booklet.

Environmental Management System (as of June 2003)



Policies

Responsible Care Initiatives
Verification Meeting**Responsible Care Initiatives**

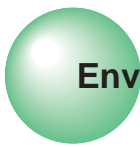
Following the Basic Approach to Responsible Care, Kuraray is engaged in Responsible Care Initiatives in each of the dimensions of the environment, disaster prevention and occupational safety and health, product safety, and communications with society.

In fiscal 2001, to ensure the steady advance of our Responsible Care Initiatives, we inaugurated the Responsible Care Initiatives Verification Meeting. At this Meeting, representatives from the head offices and plants gather to discuss the progress in the PDCA cycle of individual programs at each plant, record the progress and identify challenges. Every year, two of the six themes – environmental preservation, disaster prevention, occupational safety and health, safety of physical distribution, safety of chemicals, and communications with society – are highlighted for discussion. Action plans are prepared by a team that is assigned to propose solutions to each individual challenge presented at the Meeting, and progress is monitored at the following year's Meeting to ensure continuous improvement. In addition to the six basic themes, which are covered in their entirety over three years, themes unique to certain plants may be added to address urgent issues.

In fiscal 2002, ten of the twenty-five challenges from the previous year (such as reducing drainage to public sewerage) were improved, and the remaining fifteen were carried over. Outcomes of the Meeting are reported to management to make sure that the company-wide PDCA cycle raises the level of the initiatives.

Kuraray's Responsible Care Initiatives are subject to a comprehensive internal audit, as stipulated by the Japan Responsible Care Council, thereby ensuring improvements to the initiatives across-the-board.





ISO14001

Environmental Management System

To increase the efficiency of our environmental initiatives, the Kuraray Group encouraged its business units to obtain ISO14001 environmental certification. As a result, all domestic plants and research laboratories were certified by December 2001. Among domestic affiliated companies, Techno Soft and Kuraray Plastics have been certified, and Magictape and Kuraray Chemical are preparing for certification. Overseas, Kuraray Specialities Europe and Eval Company of America have been certified, and SEPTON Company of America has set a timetable targeting certification in September 2003. EVAL Europe is likewise planning to begin preparations for certification in Fiscal 2003.

Meanwhile, Kuraray will introduce an ISO14001-based environment management system throughout the entire organization.

We will take advantage of these environment management systems to make continuous improvements to our environmental initiatives, including reducing our environmental impact.

ISO14001 Certification

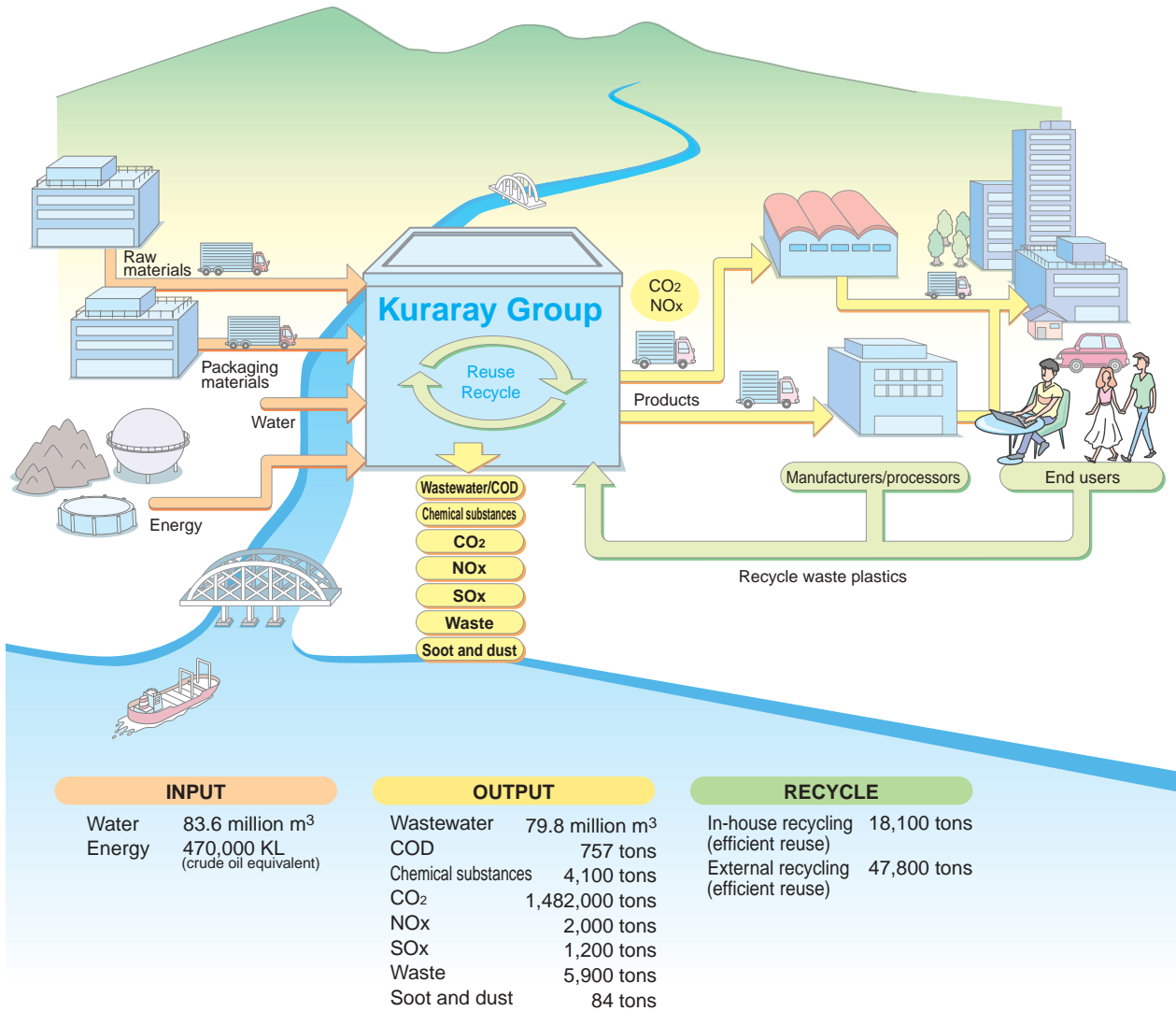
Sites	Date obtained
Kashima Plant	Mar 1999 (renewed Mar '02)
Okayama Plant	Mar 2000 (renewed Mar '02)
Nakajo Plant	Mar 2000 (renewed Mar '02)
Kurashiki Plant	Dec 2000
Tamashima Plant	Dec 2000
Saijo Plant	Dec 2000
Tsukuba Research Laboratories	Dec 2001
Techno Soft Co., Ltd.	Dec 1999 (renewed Dec '02)
Kuraray Plastics Co., Ltd.	Jan 2003
Kuraray Specialities Europe	Nov 1998 (renewed Feb '02)
Eval Company of America	Feb 2000 (renewed Feb '02)

The Advanced and Basic Technology Research Laboratories, Kurashiki Research Laboratories, and the Optical Device R&D Center are on the premises of the Kurashiki Plant and the Tsukuba Research Laboratories, respectively.

ISO14001 Internal Auditing

Within the framework of ISO14001, we conduct internal audits of each plant and research laboratory in accordance with the Internal Auditing Regulations, which stipulate such matters as the selection of a theme for internal auditing, timing, frequency, steps in recording and reporting audit results, steps in taking corrective measures, qualifications of internal auditors, a list of registered internal auditors, etc. As of March 31, 2003, 133 internal auditors were registered.

Environmental Impact of Business Activities



Efforts to Expedite LCA

In order to monitor quantitatively our impact on the environment, we are accelerating Life Cycle Assessment (LCA) initiatives at the Kurashiki plant.

In Fiscal 2002, we implemented case study presentations, our goal being to spread the concept of LCA and master LCA techniques. As we progress in propagating the objectives of LCA and the need for it, we will continue to quantify the environmental impact of more products, and apply our findings to the development of environmentally-friendly products. We are also planning to introduce an Environmental Label Type III.

An Example of LCA in Action

We changed one of the reinforcements for *MAGIC TAPE* from an organic-solvent-based one to a water-based one. When we applied LCA to this, we found that power consumption and organic chemicals released into the atmosphere were reduced by 36% and 99.5%, respectively.

Life Cycle Assessment (LCA)

A technique to monitor quantitatively the impact products may produce on the global environment by investigating total energy used, from exploitation of resources to manufacture to post-use, as well as the types and amounts of substances discharged into the environment.

Policies

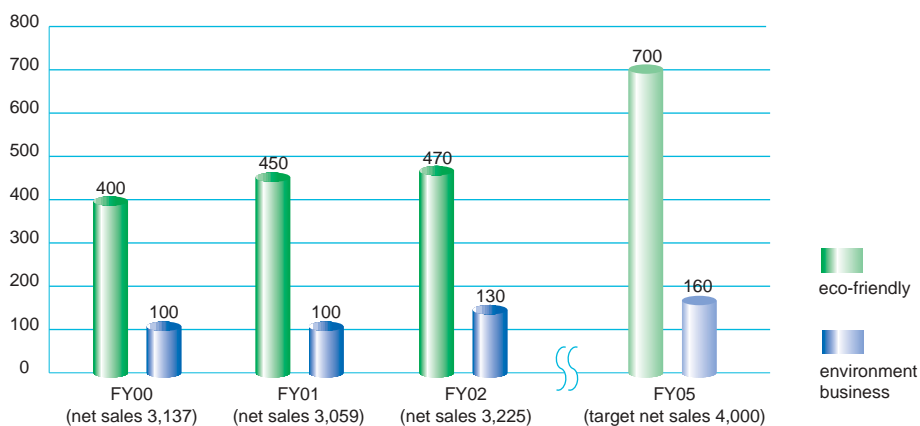
Net Sales

Main Products

Promoting environmental business

In the Medium-Term Business Plan G-21, business contributing to preservation of the global environment (= environmental business) is designated a strategic business domain, and will be emphasized accordingly. Environmental business can be divided into: ① products that can serve as substitutes for materials with substantial negative impact on the environment (eco-friendly); and ② products contributing to preservation and enhancement of the environment (environment business).

Net Sales by Category (consolidated) (millions yen)



Eco-Friendly Areas	KURALON for fiber reinforced cement, EVAL (EVOH resin)
	SEPTON and HYBRAR (thermoplastic elastomers)
	Soft Methacrylic resin, GENESTAR (heat-resistant polyamide resin)
Environment Business Areas	Activated carbon, PVA gel, industrial membrane (hollow fiber membrane)
	Water treatment system combining PVA gel and industrial membranes



SEPTON
Thermoplastic Elastomers



Soft Methacrylic Resin



GENESTAR
Heat-resistant Polyamide Resin



Activated Carbon

New Wastewater Treatment System

The wastewater treatments using microorganisms have their own drawbacks, such as low efficiency and surplus sludge. To address these issues, we developed the surplus-sludge-free wastewater treatment system, which combines PVA gel and hollow-fiber membranes. Because it treats only the surplus-sludge portion of wastewater with the hollow fiber membrane, rather than all the wastewater, this epoch-making system needs fewer membranes, achieving "zero" surplus sludge at low cost.

Lead-Removing Activated Carbon

There have been a number of cases of dissolved lead ions from lead water pipes mixing with tap water. As replacing water pipes is difficult, there is growing demand for home-use water purifiers that remove lead. Kuraray Chemical supplies home-use water purifier manufacturers with an activated carbon that not only removes offensive odors and impurities, but also lead ions.

Policies

Activities

Air Pollution Control Law

Regulates substances discharged from plants into the atmosphere to control air pollution.

- <Regulated substances>
- ① Smoke and soot: SOx, NOx, dust, chlorine and compounds of these generated as a result of combustion
 - ② Hazardous air pollutants (234 kinds)
 - ③ Coarse particulates

Efforts to prevent air pollution

The sulfur oxides (SOx) and nitrogen oxides (NOx) generated in the combustion of heavy oil or coal damage respiratory organs, kill plants and cause acid rain. Because of this, their emission concentration is regulated by the Air Pollution Control Law. The Kuraray Group is striving to reduce emissions of these substances.

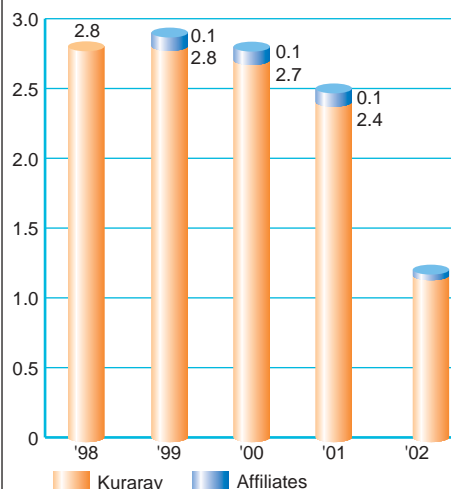
The Nakajo Plant emitted the greatest volume of SOx among the Kuraray Group. In order to improve on this, we changed the fuel for the power generation boiler from heavy oil to natural gas in June 2002. Since there's no sulfur in natural gas, the boilers produce little SOx.

In fiscal 2002, SOx emissions from the Nakajo Plant were reduced by 55% over the previous year, to 655 tons. The Okayama Plant also substantially decreased their SOx emissions, down 60% to 270 tons, by improving the treatment of smoke and soot from their power generation boilers. As a result, total SOx emissions by the Kuraray Group amounted to 1,198 tons, down 52% over the previous year.

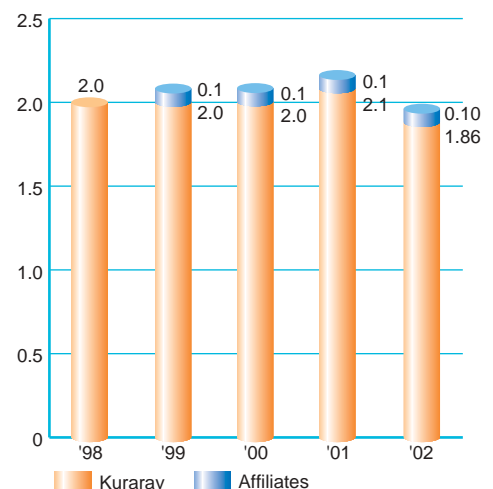
NOx emissions had been flat for several years, but, through the above-mentioned fuel conversion, we reduced NOx emissions at the Nakajo Plant by 37%. With a review of combustion conditions and reduction efforts at the Okayama Plant, total NOx emissions by the Kuraray Group in fiscal 2002 were reduced 12% over the previous year.



SOx Emissions
(1,000 tons)



NOx Emissions
(1,000 tons)



Working to Reduce Environmental Impact

Policies

Activities

Water Pollution Control Law

Controls the quality of water discharged into public water bodies (rivers, lakes and reservoirs, ports and harbors, coastal waters, etc.) by regulating their COD, pH, etc.

- ① Hydrogen ion concentration, COD, BOD, suspended particles, nitrogen, phosphate, etc.
- ② Twenty-six substances, including cadmium, cyanides, lead and PCBs

Law Concerning Special Measures for Conservation of the Environment of the Seto Inland Sea

A special law designed to conserve the environment of the Seto Inland Sea (water quality, natural scenery, etc.).

Coming under the Water Pollution Control Law, it is the fifth total water pollutant emissions regulation (tighter total COD emission control, total nitrogen and phosphate emission control, mandatory measurement of nitrogen and phosphate in wastewater) for the improvement of water quality in specific seas (Tokyo Bay, Ise Bay, Seto Inland Sea). Accordingly, water quality regulations in the Special Law were revised and tightened.

Policies

Efforts to prevent water pollution

The Kuraray Group is controlling the quality of wastewater by setting voluntary control standards that are tighter than the wastewater quality standards of the Water Pollution Control Law and municipal ordinances.

Measuring instruments are installed at each plant to strengthen monitoring of drainage, and wastewater treatment equipment incorporating the activated sludge process to reduce the environmental impact of wastewater.

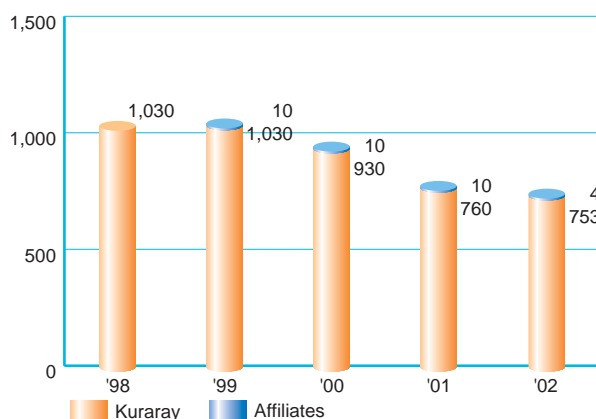
In response to the revision in the Law Concerning Special Measures for Conservation of the Environment of the Seto Inland Sea, which mandates total phosphate and nitrogen emission control and measurements of phosphate and nitrogen from April 2004, automatic measuring instruments will be installed at the Kurashiki Plant, Okayama Plant, Kuraray Tamashima, Kuraray Saijo and Kuraray Chemical's Tsurumi Plant in fiscal 2003.

In fiscal 2002, COD emissions were 757 tons, down 13 tons from the previous year. We strive to improve wastewater quality further by reducing substances generated in the production process and by improving wastewater treatment equipment.

COD (chemical oxygen demand)

An indicator of water pollution by organic chemical substances. The higher the concentration is, the more polluted the water.

COD Emissions (tons)



Management of substances that deplete the ozone layer

The Kuraray Group is planning to convert the refrigerant it uses in freezers from CFC-11, a "specified substance" designated in the Law Concerning the Protection of the Ozone Layer through Regulation, etc., of Specified Substances, to a CFC substitute by 2010. CFC-11 consumption at the end of March 2002 was 9.7 tons, registering no change from the end of the previous fiscal year.

Emissions of Primary Ozone-Layer-Depleting Substances

	Ozone layer depleting coefficient	Emissions (tons)		CFC equivalent (tons)	
		FY01	FY02	FY01	FY02
Hydrochlorofluorocarbon (HCFC-123)	0.02	0.93	1.52	0.02	0.03
Chlorofluorocarbon (CFC-11)	1.00	0.50	0.46	0.50	0.46
Carbon tetrachloride	1.10	0.01	0.01	0.01	0.01
1.1.1-trichloroethane (methylchloroform)	0.10	0.00	0.00	0.00	0.00
Three specified halons	3.0 ~ 10.0	0.00	0.00	0.00	0.00
Hydrobromofluorocarbons	0.1 ~ 14.0	0.00	0.00	0.00	0.00
Ethyl bromide	0.60	0.00	0.00	0.00	0.00
Total		1.44	1.99	0.53	0.50

Policies

Efforts to arrest global warming

Although we are reducing CO₂ emissions in accordance with the target in the Medium-Term Environmental Plan to improve energy efficiency by 1% each year, energy conservation alone doesn't significantly reduce CO₂ emissions. For fiscal 2003, we will set and aim for a numerical target for reduction in CO₂ emissions (absolute amount).

Activities

① Energy conservation

Energy consumption by the Group was reduced by 9,000 KL (crude oil equivalent) through the introduction of energy-efficient power generation turbines, waste heat recovery, inverter motors, and changeover to high-efficiency electric equipment.

② Reducing CO₂ emissions

At Kuraray Tamashima, we are using waste plastics collected from outside as boiler fuel to reduce coal consumption, thus reducing CO₂ emissions.

In fiscal 2002, waste plastics consumption increased by 2,300 tons, as a result, CO₂ emissions declined by 7,000 tons. At the Nakajo Plant, we converted a power generation boiler fuel from heavy oil to low-carbon natural gas in June 2002, reducing CO₂ emissions by 3,000

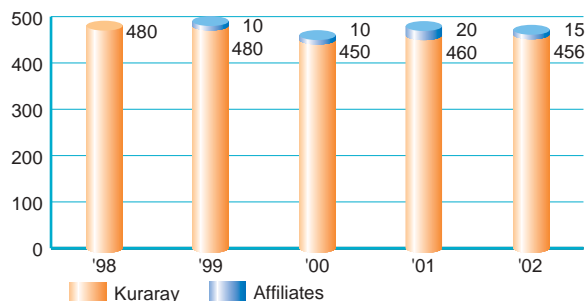
tons. Moreover, we cut an additional 16,400 tons of CO₂ emissions through the previously mentioned energy-conservation measures.

As a result, CO₂ emissions for the Group totaled 1.48 million tons, a slight increase of 0.8% year-on-year, despite increased production.

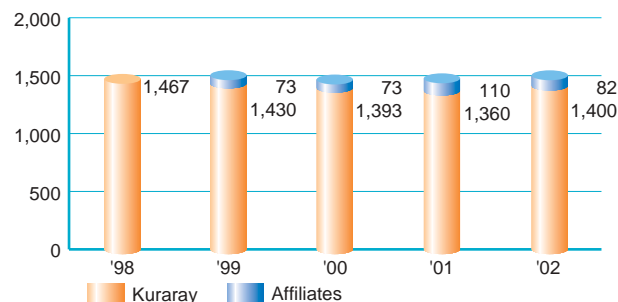
In fiscal 2001, we started monitoring the emissions of greenhouse gases other than CO₂. These showed a year-on-year decline in fiscal 2002.

Energy Consumption

(crude oil equivalent: 1,000 KL)

CO₂ Emissions

(1,000 tons-CO₂)

Emissions of Greenhouse Gases Other than CO₂

	Heat-trapping coefficient	Emissions (tons)		Tonnage in CO ₂ equivalent	
		FY01	FY02	FY01	FY02
Methane	21	4.9	2.5	102.9	52.5
Nitrous oxide	310	-	-	-	-
Hydrofluorocarbons	140 ~ 11,700	0	0	0	0
Perfluorocarbons	6,500 ~ 9,200	0	0	0	0
Sulfur hexafluoride	23,900	0	0	0	0
Total		4.9	2.5	102.9	52.5

Policies

Activities

CO₂ emissions = weight (tons) x distance (km) x per-unit emissions

NO_x emissions = weight (tons) x distance (km) x per-unit emissions

* The above data includes emissions resulting from transport of products shipped from Kuraray's plants. It does not include emissions resulting from transport of products shipped from sales office warehouses and processing sites, intermediates, and raw materials.

Regulations on automobile types in the Automobile NO_x PM Law (Revised Automobile NO_x Law)

To reduce emissions of NO_x and particulates in designated areas, special emission standards have been set for specific types of automobiles, thereby encouraging use of smaller vehicles with lower emissions.

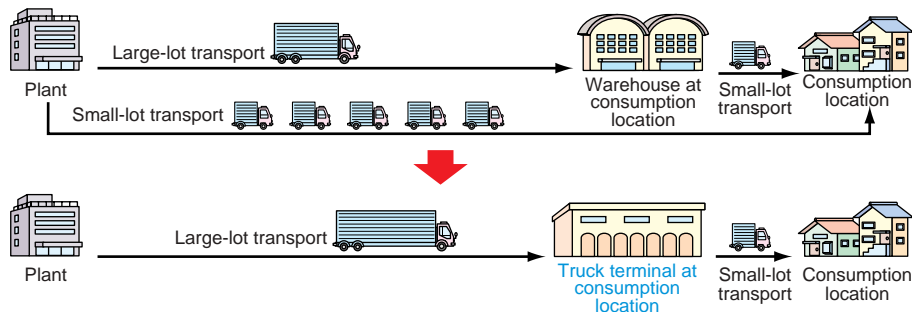
Reducing environmental impact during transport

In an attempt to reduce substances that impact the environment, such as CO₂ and NO_x, during transport, Kuraray is increasing its use of efficient modes of transport and expediting the modal shift. We are boosting our efforts in this regard, with the goal of reducing CO₂ and NO_x emissions during transport by 15% and 10%, respectively, by fiscal 2005 (vs. fiscal 2000).

In fiscal 2002, our CO₂ emissions dropped 5.0% year-on-year to 25,732 tons, and NO_x emissions, 2.3% to 104.8 tons, through greater transport efficiency, promotion of modal shifts and cooperation with logistics partners.

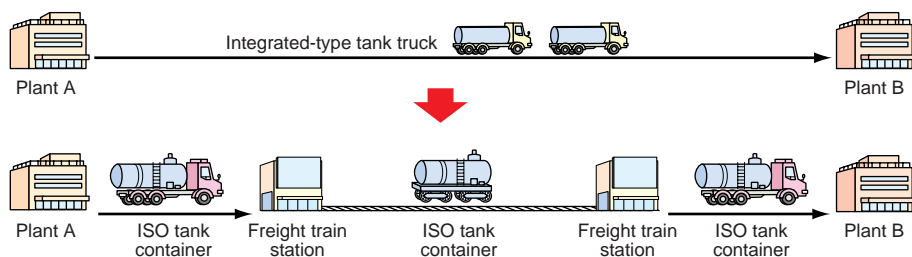
① Greater transport efficiency (e.g., greater efficiency in vehicle operations through a cross-docking system)

We succeeded in substantially improving transport efficiency by trucking with large vehicles to terminals at consumption locations, instead of transporting to these locations in small lots. Use of the system reached 42.6% at the Okayama Plant and Kuraray Tamashima in fiscal 2002, a rise of 24.3 percentage points over the previous year.



② Promotion of modal shift (e.g., combined transport using ISO tanks)

To transport liquid chemicals among plants, we use a railway combined transport, which uses large-capacity ISO tank containers. Moving large amounts of chemicals by rail has helped reduce environmental impact.



③ Cooperation with logistic partners

Kuraray assessed the environmental friendliness of transport partners against the Green Purchasing Guidelines, to evaluate their packaging specifications and transport practices for sufficient savings of energy and resources and reduction of exhaust gases. We provide individual guidance to those who fail to meet the Guidelines, ensuring compliance among all our transport partners.

When the Automobile NO_x PM Law goes into effect in October 2003, transport businesses will face certain restrictions that oblige the use of low-polluting vehicles. Kuraray will assist our transport partners in fulfilling these new obligations. Meanwhile, we will expedite the shift from diesel to electric forklifts at our warehouses and those of our partners.

Policies

Activities

PRTR Law (Pollutant Release and Transfer Resister)

Regulations to monitor the amounts of specific chemical substances either released from plants to the atmosphere, water bodies, etc., or transferred outside of the plant in the form of waste, etc., report the same to the national government, and prepare and publish an MSDS (Material Safety Data Sheet).

The data is open to the public, so that voluntary activities by enterprises will lead to reductions in the release of chemical substances into the environment.

<Chemical substances covered>

- ① Class I designated chemical substances
A total of 354 substances whose release and transfer amounts are obliged to monitor and report, and prepare and publish an MSDS
- ② Class II designated chemical substances
A total of 81 substances obliged to prepare and publish an MSDS

Management of chemicals

The Kuraray Group uses a variety of chemical substances as materials or in the production process. They are highly useful, but could cause many forms of risk to the environment if not handled properly. We set a target for control of chemical substances in the Medium-Term Environmental Plan, to reduce 90% emissions including substances specified by the PRTR Law* by fiscal 2005.

The Kuraray Group exercises appropriate controls for chemical substances under the PRTR Law and the Law Relating to Special Arrangements for Countermeasures against Dioxin. We are improving our voluntary control of chemical substances through active participation in voluntary PRTR and HPV programs organized by the Japan Chemical Industry Association (JCIA).

*Substances covered by JCIA's voluntary PRTR system (includes all the substances covered by the PRTR Law).

Reducing the release and transfer of chemical substances

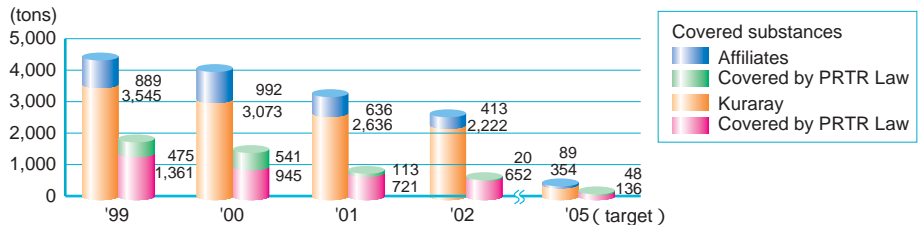
The Kuraray Group now handles 77 chemical substances (including 43 covered under the PRTR Law) of the 480 covered by the JCIA (354 designated under the PRTR Law). In fiscal 2002, we succeeded in reducing the release volume of these chemicals to 2,635 tons (672 tons for those under the PRTR Law), and their transfer to 1,437 tons (259 tons) by installing equipment that recovers gas released from isoprene tanks, for a reduction of 32% in the combined release and transfer volume versus fiscal 1999 (10.6% vs. fiscal 2001). However, the volume of transfer increased by 153 tons from the previous year, owing to the transfer of chemical substances in wastewater to a jointly established sewage treatment company.

In fiscal 2003, we plan to reduce the release and transfer volume of substances covered by the PRTR Law* to 3,600 tons (down 40% vs. fiscal 1999, down 12% vs. fiscal 2002) by reducing the release of vinyl acetate and methanol, a high priority initiative throughout the entire group.

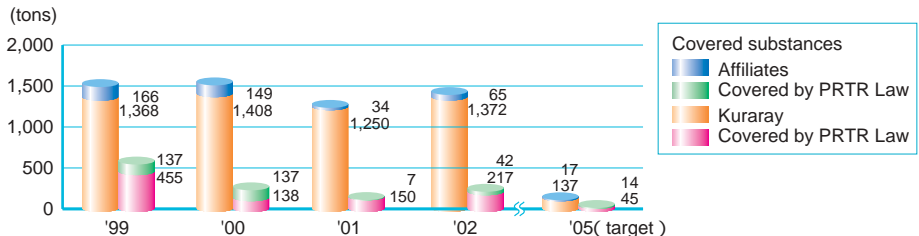
Substances Covered by the JCIA Voluntary Management Program and by the PRTR Law

	Number of Covered substances	Kuraray Group (FY02)
Covered by JCIA Voluntary Management Program	480	77
Covered by PRTR Law	354	43

Releases of Covered Substances



Transfer of Covered Substances



* Release and transfer for each of the substances covered by the PRTR Law (FY02) can be found at our URL (<http://www.kuraray.co.jp/social/index.html>).

The Law Relating to Special Arrangements for Countermeasures against Dioxin

Regulates the amount of dioxin released to the environment.

- ① Regulates the release volume of dioxin in gases and wastewater from specific facilities (waste incineration plants, etc.).
- ② Regulates the structure and control of specific facilities (waste incineration plants, etc.).
- ③ Stipulates purification of dioxin-polluted soil

Dioxins management

The Law Relating to Special Arrangements for Countermeasures against Dioxin obliged businesses to improve the structure of waste incinerators and tighten regulations on their control by November 2002. Accordingly, we ceased operating 24 of our 30 waste incinerators, and remodeled the remaining 6 to comply with the new regulations.

Removing asbestos

The Ministry of Health, Labor and Welfare is considering prohibition of the use of asbestos, except for special applications like sealing materials at chemical plants. We are planning to change the asbestos used at some of our plants to an alternative material.

Alternatives for endocrine-disrupting substances

In August 2001, the Ministry of Environment announced that in its opinion nonylphenol could affect the eco-system by disrupting endocrines in fish. Since we use nonylphenol derivatives for production, we are testing substitutes and will begin the changeover process for some products by March 2004.

HPV Programs

The HPV (High Production Volume) Program was initiated in 1992 by the Organization for Economic Cooperation and Development (OECD), to collect the hazard data necessary to evaluate the risks associated with chemical substances that are presently manufactured in large quantities. Manufacturers of these chemicals are now working together to gather that hazard data.

The Kuraray Group's independent efforts in this regard focus on seven chemical substances covered by the PRTR Law, including linalool, prenol, isoprene, pseudoionone, sulfuric acid, acetic acid and tertiary butyl alcohol.

Legal compliance

We have established documented procedures within the ISO14001 environmental management system for each plant to comply with laws and regulations on environmental preservation, in an effort to appropriately address those laws and regulations. These procedures provide guidelines on how to specify information channels on the related laws and regulations, communicate the establishment of and amendments and alternations to the laws and regulations, and define rules on reviewing their implementation by each department. Minor problems and unexpected situations at a plant could lead to impact on the external environment, resulting in noncompliance. To prevent this from happening, we have set up voluntary standards for management of emissions into the atmosphere and water that are stricter than the current laws and regulations.

Dealing with illegal abandoned industrial waste

Waste oil at an industrial waste treatment facility of a Fukushima-based business shut down in 1994 had been left untreated. Since a small portion of this waste oil came from us, we provided support in the administrative execution by proxy, at the request of the Fukushima Prefectural Government. This unfortunate incident occurred when the Manifest (industrial waste management sheet) System was applied to specific waste only. We are now scrupulous in our management of manifests, and make on-site visits to treatment facilities every year, taking the greatest care to avoid any possibility of illegal abandonment and dumping.

Dealing with emergencies

During fiscal 2002, we experienced no incidence of any emergency that negatively affected the environment.

Kuraray is doing its utmost to prevent emergencies from occurring. Among the measures we take to prevent environmental accidents are patrolling of pipelines and facilities where dangerous substances are handled, use of oil fences when unloading heavy oil, and environmental education in line with ISO14001.

Each plant follows guidelines on emergency measures, as stipulated in the Regulations on Preparations and Measures against Emergency within the ISO14001-certified system. Specific emergency measures include: assessment of potential for accidents and emergencies; review of emergency procedures; establishment of preventive and mitigating measures; testing of the measures; and evaluation of the need to review the measures.



An Oil Fence

Policies

Activities

Zero Emissions

The concept of "zero emissions" was first proposed in 1994 by the United Nations University (one of the committees established by the UN General Assembly) in its plan for waste-free industry, which is generally designed to reduce waste to zero by finding new applications for it, thereby creating a new resource-recycling industrial society.

Efforts to reduce waste emissions to zero

The Kuraray Group's efforts to reduce emissions of industrial waste to zero include the improvement of production processes with a view to reducing, reusing and recycling materials, and the development of efficient applications for waste. The Medium-Term Environmental Plan establishes targets for fiscal 2005 of reducing the volume of externally processed industrial waste by 90% and increasing waste utilization efficiency by 20 percentage points, both against fiscal 1999 as the base year. Under the leadership of the Industrial Waste Reduction Committee, we are mounting a variety of programs in this regard. In the process of reviewing the Medium-Term Environmental Plan, we defined "zero emissions" of waste in the Kuraray Group, commencing the initiative in stages.

The Kuraray Group zero waste emissions

- Stage 1: Reduce the final amount of waste destined for landfill to less than 1% of the total waste generated at a site by expediting efficient use of waste
- Stage 2: Reduce the final amount of unutilized waste from our sites destined for landfill or simply incinerated to zero %

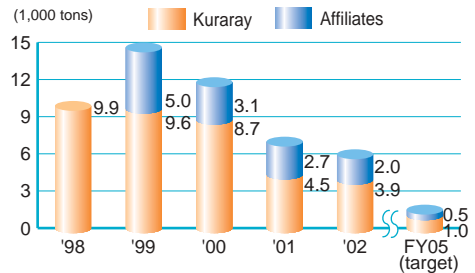
We expect the Okayama Plant, Kashima Plant and Kuraray Tamashima to achieve Stage 1 in fiscal 2003, with Kuraray Tamashima attaining Stage 2 by fiscal 2005.

Programs for achieving targets in the Medium-Term Environmental Plan

- ① Efficient use of materials and reuse of packaging materials
- ② Development of a zero surplus sludge system in treating wastewater
- ③ Efficient utilization of waste through separation
- ④ Thermal recycling by turning waste plastics into solid fuels
- ⑤ Efficient utilization of incinerator ash
- ⑥ Use of a resource-recycling waste treatment facility in Kurashiki City

In fiscal 2002, the volume of industrial waste processed by outside contractors for Kuraray was 5,900 tons, a 60% reduction from the fiscal 1999 base year level (down 18% year-on-year). The effective reuse ratio for waste reached 81%, an increase of 21 points over the base year, achieving the fiscal 2005 targets in the Medium-Term Environmental Plan. In fiscal 2003, we are planning to promote efficient utilization of waste through stricter separation and develop techniques for effective utilization, looking to reduce the volume of industrial waste processed by outside contractors to 3,900 tons (down 73% vs. fiscal 1999, 34% vs. fiscal 2002) and increase the effective reuse ratio of waste to around 85%.

Volume of Industrial Waste Processed by Outside Contractors

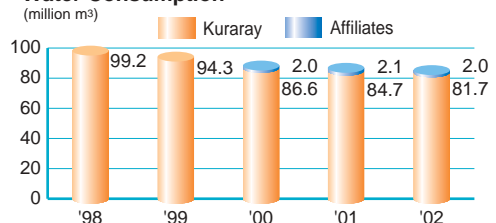


Efforts to conserve resources

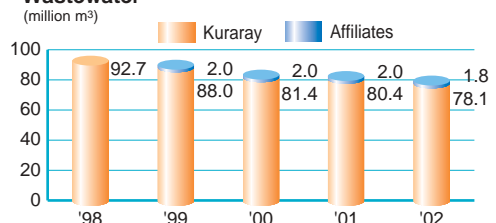
Conserving resources requires putting every single element to efficient use and eliminating all waste. This demands a variety of initiatives, such as efficient use of raw materials, reduction in water consumption, promotion of reuse and recycling, extension of product life cycles, and reuse and reduction of packaging materials.

Initiatives by the Kuraray Group include: increasing production yields; adopting production processes that allow defective and semi-finished products to be recycled into materials; and recycling spent water.

Water Consumption



Wastewater





Green Purchasing

Policies

Green Purchasing Standards

- Scope of Green Purchasing**
- ① Materials used to develop and manufacture products
 - ② Mechanical appliances used to develop and manufacture products
 - ③ Packaging materials and containers used for delivery and transport of products
 - ④ Equipment and consumables used for marketing and administrative operations
 - ⑤ Outsourced business services, such as manufacturing, sales and logistics

Green purchasing

Green purchasing

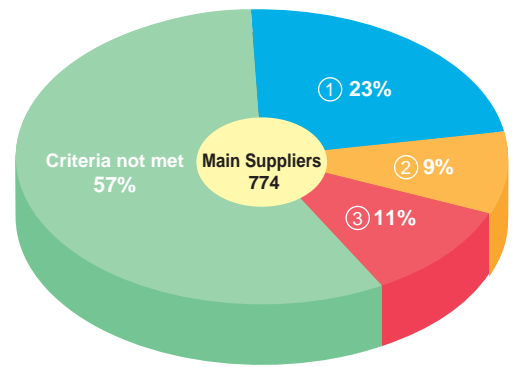
In effect since April 2001, the Green Purchasing Law mandates placing priority on purchasing products and services with low environmental impact. Development of environmentally friendly businesses and products logically mandates the purchase of materials and components with low environmental impact. In fiscal 2001, the Kuraray Group set internal regulations for green purchasing of office consumables and production materials that give priority to eco-friendly products and services.

In March 2002, we established Green Purchasing Standards, applicable to production materials, giving higher priority to environmentally conscious suppliers. In fiscal 2002, we assessed the "greenness" of our principal suppliers, and provided individual guidance to those who failed to meet the Green Purchasing Standards, so that all our suppliers would comply with the Standards.

Criteria for suppliers

- ① Certified to ISO14001
- ② Certification to ISO14001 under plan, and auditing institutes and date of auditing are fixed
- ③ If ① or ② above do not apply, the following criteria must be met:

- Corporate philosophy/policy on environmental conservation
- Organization/plan for environmental conservation
- Assessment of impact on the environment
- Environmental education/disclosure
- Environmentally-friendly logistics



We have established our own Green Purchasing Guidelines for the purchase of "green" products. In fiscal 2002, we expanded the scope to automobiles and stationery.

Status of Green Purchasing

Category	Item	Value of Purchases in FY02 (millions yen)	Green purchasing ratio	
			FY01	FY02
1 Paper (recycle)	5 items Copier paper, forms, printing paper, sanitary paper, business cards	50	100%	100%
2 Stationery (recycle)	47 items Mechanical pencils, ballpoint pens, markers, pencils, etc.	8	80%	90%
3 Furnishings (reuse)	8 items Chairs, desks, shelving, cabinets, low partitions, bulletin boards, chalkboards, whiteboards	8	80%	80%
4 OA equipment (energy-saving)	4 items PCs, printers, copiers, facsimile machines	263 (leasing fees)	100%	100%
5 Appliances (energy-saving)	4 items Refrigerators, air-conditioners, TVs, VCRs	8	80%	80%
6 Lighting (energy-saving)	2 items Fluorescent lighting apparatus, fluorescent tubes	9	100%	100%
7 Automobiles (reduce pollutants)	1 item Automobiles	64 (leasing fees)	30%	70%
8 Uniforms and work clothes (recycle)	2 items Uniforms, work clothes	-	-	-
9 Work gloves (recycle)	1 item Work gloves	4	0%	50%

* Uniforms and work clothes: to be replaced in fiscal 2005 with items made from our recycled polyester fibers

Social Report

The Social Report details the Kuraray Group's perspectives with regard to "initiatives to assure safety," "relationship with employees" and "relationship with society."

"Initiatives to assure safety"

We ensure safety by eliminating any risks involved in the development, production, marketing and use of our products.

"Relationship with employees"

We create a workplace environment where individuals have the freedom to act on their own initiative in their work.

"Relationship with society"

We fulfill our responsibility to society as a corporate citizen.

Policies

Activities



Policies

Activities

Disaster prevention

To facilitate substantive improvement in the safety of its facilities and equipment, Kuraray has adopted the Equipment Safety Design Guideline and Safety Inspection Standard. In live with these standards, we inspect our facilities at four stages (design, construction, before test runs, after startup) when the installation of new equipment or major changes in operating conditions. Existing equipment and facilities are also checked for safety to ensure the prevention of accidents and disasters. In addition, discussion of "disaster prevention" is one of the key agenda items at the Responsible Care Initiatives Verification Meeting, in order to improve the level of our disaster prevention programs.

Our discussion in the fiscal 2002 Responsible Care Initiatives Verification Meeting included anti-terrorism measures and improvement of disaster prevention training. We have drafted action plans to find solutions to each of these. We are also striving to improve the level of safety through simulated training in emergency communications, industrial accident simulation training, and education in the prevention of industrial accidents. Annual suspension of operations to overhaul "high-pressure gas equipment" and "boilers and Category 1 pressure vessels" is mandatory. However, "items of equipment deemed to satisfy the legal requirements for safety control and equipment control" may be operated for two years or longer, provided they are inspected while in operation. Accordingly, our Okayama Plant has obtained certification for their "high-pressure gas equipment" and "boilers and Category 1 pressure vessels," and the Kashima Plant and Kuraray Saijo, for their "boilers and Category 1 pressure vessels," and the equipment, boilers and vessels are being operated continuously for two years. The Okayama Plant underwent a renewal inspection and was re-certified, as its certification for "high-pressure gas equipment" expired in fiscal 2002.

Product safety

In line with its Principles for Business Conduct, the Kuraray Group has established a Product Safety Basic Policy and Action Guidelines for Product Safety to ensure the safety of our products.

Product Safety Basic Policy

We will endeavor to contribute to creating an affluent, comfortable society by meeting customer needs through the supply of safe and reliable products.

Action Guidelines for Product Safety

1. Supply products that conform to the level of safety expected by society in accordance with safety-related laws and regulations and the latest technological levels.
2. Minimize any predictable risk that may be associated with our products.
3. Maintain an appropriate quality management system to ensure that all products meet requisite quality and safety standards.
4. Provide accurate production information to customers and users to prevent accidents due to inappropriate use or handling.
5. Endeavor to develop safer products and improve technology for product safety.
6. Endeavor to augment the framework for information gathering and cooperation from both within and outside of the Company to ensure and improve product safety and take quick action against any incident.
7. Endeavor to raise the awareness of product safety among all employees and develop product safety specialists.

Organizational structure

The Quality and Product Liability (PL) Committee is responsible for the company-wide promotion of product safety initiatives. To ensure the quality and safety of our products, a supervisor of quality assurance initiatives is placed under the head office, and a Quality Control Section is established at each plant.

In order to ensure that our efforts for quality are centered on our customers, the Kuraray Group has obtained the ISO9001 international certification on quality management. We are planning to introduce our unique quality management system to the head office in building a company-wide quality management system.

Present Status of ISO9001 Certification

Sites	Versions
Nakajo, Kashima, Okayama, Kurashiki Plants Kuraray Saijo, Kuraray Tamashima, Kuraray Chemical, Kuraray Plastics Kuraray Techno, Magictape	ISO9001, 2000 ver.
Kuraray Medical	ISO9001, 1994 ver.*

* Plans for certification to the ISO9001 2000 ver. at renewal in October 2003

Product safety over the entire life cycle

During the product development process, we give due cognizance to the potential effects our products may have on the environment and on human health and safety at every stage of their life cycle, from R&D through to eventual disposal, in accordance with the Product Safety Management Standards for the R&D Stage, Product Stage Management Standards up to Market Launch and Guidelines for Compilation and Control of Operating Instructions. We are studying ways to solve possible problems as early as possible by changing raw materials or production processes to reduce the impact on the environment wherever potential issues are anticipated.

Expanding the Material Safety Data Sheet (MSDS) system

The MSDS is a data sheet which is delivered when a firm supplies designated chemicals to other firms, and contains information necessary to handle the chemicals. In accordance with the Guidelines for the Control of MSDSs, we ensure the proper use of MSDSs.

Kuraray has compiled a database of accumulated MSDSs, so employees can have access to it. We are developing a search system that encompasses affiliated companies as well. We are also planning to put the MSDSs of our products on our website for easy public access.



MSDS (Material Safety Data Sheet)

Safety in logistics

The Kuraray Group has tightened its already strict safety controls for chemicals during transport in accordance with our own Distribution Safety Management Standards and regulations for their implementation. Items containing specific substances and all items in liquid form are subject to safety management procedures based on these standards and regulations whenever they are shipped, stored, loaded or unloaded.

Organizational structure

Distribution safety control officers are assigned to oversee these tasks. One of their responsibilities is to provide the necessary training and education to the Kuraray distribution staff and the people contracted to transport the chemicals in order to maintain quality and ensure the safe handling of chemicals. To safeguard against accidents during transport, we keep sandbags at the ready (for preventing the spread of damage) and maintain a communications tree for emergency dispatch. We also conduct regular emergency communications training with contracted distribution businesses.

Supplying MSDSs

In accordance with the Guidelines for the Control of Product Safety Data Sheet, we supply MSDSs to distribution contractors to improve safety during transport.

Yellow Cards

Under the Guidelines for the Control of Yellow Cards, truck drivers are required to carry a Yellow Card (emergency response card), which details information on the chemical properties and potential dangers of the items being transported, as well as emergency procedures and whom to contact should a problem occur, so they can prevent the spread of any damage.



Yellow Cards

Policies

Activities

Policies

Activities

OSHMS (Occupational Safety & Health Management System)

Aims at improving occupational safety and health by reducing dangers at workplaces to "zero." Assigns a numerical scale to the degree of danger to enable measurement of progress to this zero goal.

- ① Sets policies
- ② Assesses the level of risk posed by equipment and operations on a numerical scale, determines risk-management measures
- ③ Identifies legal matters related to occupational safety and health
- ④ Sets targets
- ⑤ Draws up concrete action programs
- ⑥ Provides education and training on occupational safety and health
- ⑦ Develops rules for operations, puts plans into action
- ⑧ Reviews and audits performance records and legal compliance, corrects instances of non-compliance, checks the functioning of systems, and renews policies, targets and plans

Occupational safety and health

The Kuraray Group bases its initiatives to improve occupational safety and health and create "danger-free" workplaces on the Principles for Business Conduct. In fiscal 2002, we expanded the scope of our exchange of occupational disaster cases to include our overseas affiliates.

Responsible Care Initiatives Verification Meeting (P.13)

Taking "occupational safety" as a key theme, the Meeting helps raise the level of our initiatives in this important area. In fiscal 2002, action plans were drafted to resolve issues like "improvement of on-site patrols" and "safety measures for one-man operations."

Kuraray Group Environment and Safety Convention

With the participation of the president, a managing director and staff from the Kuraray Group, the Convention provides an opportunity to share information and elevate awareness of environmental safety through presentations on initiatives for "occupational safety" and "environmental conservation" underway at each workplace.

TPM protocol

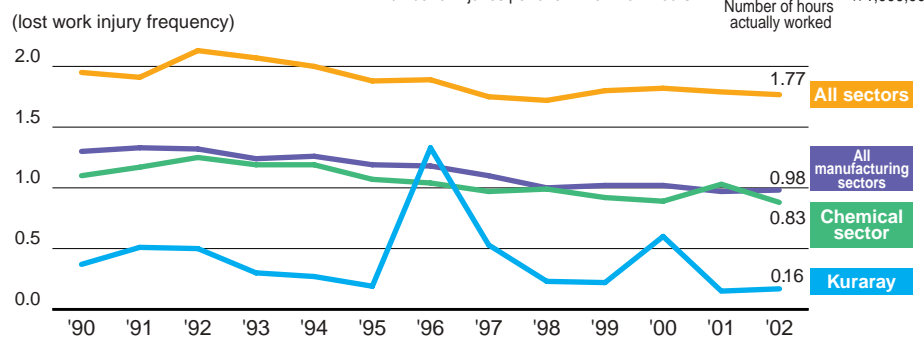
In fiscal 1997, we launched our Total Productive Maintenance (TPM) protocol in order to regenerate safety awareness among the employees, see that equipment is essentially safe, and create a clear picture of dangers by expressing their degree on a numerical scale, identifying dangerous equipment, and pointing out specific dangers with illustrations.

Introduction of OSHMS

In fiscal 2000, Kuraray Saijo introduced the OSHMS in an effort to systemize their occupational safety initiatives. Finding that this system has been instrumental in reducing workplace danger to "zero," we started introducing it at all our production sites in fiscal 2003.

Occupational Safety Performance (lost work injury frequency)

$$\text{Lost work injury frequency:} \quad \text{Number of injuries per one million work hours} = \frac{\text{Number of injuries}}{\text{Number of hours actually worked}} \times 1,000,000$$



Policies

Personnel affairs policies

The Kuraray Group strives to make its personnel affairs system fair and transparent, so that individual employees can take the initiative in demonstrating their talents. We are also dedicated to fairness in rating and remunerating individual talent, and encouraging its development, so that our employees may gain self-fulfillment through their work, feel a sense of achievement, and find a motive for living.

Programs to help employees find fulfillment

Management by objectives

Each and every employee sets personal job and skill development objectives at regular intervals. Progress in achieving these objectives provides the cornerstone for fair evaluations and remuneration.

Open invitation to vacant posts

Ensures that all employees can work in the area of their preference and so fulfill themselves.

Response to changing working styles

Changes in society and diversification in workers' attitudes toward working styles have made it necessary to look at the different kinds of talent in a new light. We have been responding to this with flexibility, introducing new schemes like temporary retirement to do volunteer activities, home nursing, childcare, etc.

Providing job opportunities

Through a tie-up with the social welfare institute Rainbow House and the establishment of a massage room, we are providing job opportunities for the physically handicapped.



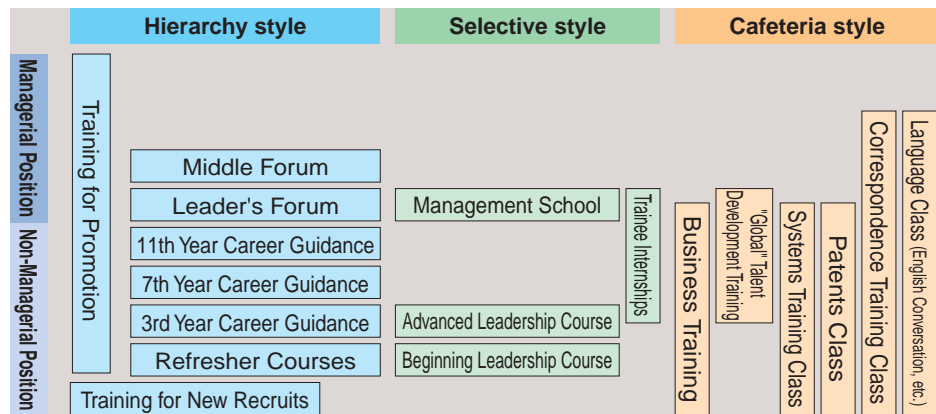
Rainbow House

Policies

Education and training

If the Kuraray Group is to sustain its growth, it is crucial that it support employees in cultivating and using their talents to the greatest advantage. The management by objectives program creates the opportunity for employees to take the initiative in developing their talents by setting personal targets. At each stage in their growth, employees receive the support they need to pursue their career goals and perfect their skills through on-the-job and other training opportunities.

Training Programs



Business Training

Relationship with Employees

Policies

Mental health care

The Kuraray Group offers a series of programs designed to help employees maintain their health, including the establishment of a clinic and health control room, provision of physical checkups and health instruction, and support for mental health care and building physical strength. Recently, greater emphasis has gone to mental health care, as changes in modes of work lead to more stress-related diseases.

(1) Augmenting health instruction programs

Legally required health examinations, health examinations to prevent lifestyle diseases, gynecological health examinations, cancer checkups, dental checkups, subsidies for medical checkups

(2) Mental health care

- "Counseling Room for Mental Diseases" operated by psychiatrists and counselors
- "Listener Training" for managers
- Health consultations via telephone
- Delivery of educational brochures, organizing lectures

Listener Training

Learning how to listen to others and communicate with them, with the goal of learning to try to understand what others feel

Relationship with Society

Policies

Social contributions

Towards being a valued corporate citizen of our host communities, we carry out exchange programs that are "steady and sustainable and embody Kuraray values" and that "all employees can participate in."

Chemistry Classes for Boys and Girls



Chemistry Classes for Boys and Girls

To provide children with opportunities to discover the "joy of chemistry" through experiments and experiences, since 1992 we have been sponsoring Chemistry Classes for Boys and Girls for elementary students. The classes are held in a "classroom" on the plant premises or at neighboring elementary schools, with young employees volunteering their holidays as lecturers and assistants. The children are invited to participate in experiments designed especially to appeal to them – like changing colors and shapes.

In fiscal 2002, the Okayama Plant joined the program, bringing the total number of classes to twelve for 368 children at five plants. In May 2003, the 100th class was celebrated at the Okayama Plant (total attendees to date: 3,188). Beyond our own Chemistry Classes for Boys and Girls, we are frequently invited to participate in similar events sponsored by Industrial organs and government agencies.

The Chemistry Classes for Boys and Girls was awarded the Fiscal 1999 Recognition of Meritorious Achievement in Outstanding Corporate Consumer Outreach Activities by the Ministry of Economy, Trade and Industry.



Dream Chemistry-21, sponsored by JCIA

Recent themes

- The Story of Water: making banana juice transparent
- The Story of Odors: making fragrances and making smelling substances
- Making Fibers: making fibers from PET bottles, making paper from synthetic fibers

Historical Data

Plant	No. of classes to date	Attendees
Kurashiki	39	1,158
Kuraray Saijo	31	1,019
Nakajo	23	701
Kashima	2	141
Okayama	5	169
Total	100	3,188

Figures as of May 31, 2003



Environment class for elementary school children at the Kurashiki Plant

Contributing to society through community medical services

We are serving communities via medical services provided by Kurashiki Central Hospital (Okayama Prefecture), Aizenbashi Hospital (Osaka Prefecture) and Saijo Central Hospital (Ehime Prefecture), which have had close relationships with the Kuraray Group since their establishment.



Kurashiki Central Hospital



Aizenbashi Hospital



Saijo Central Hospital



Kuraray Fureai Fund Raising (matching gift)

Employees contribute a fraction of their monthly pay (less than 100 yen), and the Company matches their contributions. We use the fund to present wheelchairs, etc. to welfare facilities in the community.

Open Lectures

We often offer open lectures in order to open plants to their host communities through greater communication. In fiscal 2002, a lecture on "The Appeal of the Ohara Museum of Art" was presented at the Kurashiki, Nakajo plants and Kuraray Saijo.



Sports Meets

Kuraray sponsors sports meets at its gymnasiums and athletic fields, as well as hold soccer tournaments and tennis tournaments, in an effort to make ourselves an open and familiar presence to our neighbors in their local communities.

Community Events

Our interaction with host communities takes a variety of forms, including flower viewing parties, clean-ups, volunteer activities, plant tours and exhibitions and spot-sale of artwork by students from schools for the handicapped.



Cherry Blossom Viewing Party

Internship

We offer internships for engineering students to allow them to learn more about the Kuraray Group and give them work experience. Every year, students from both Japan and overseas spend between two weeks and two months gaining work experience at our R&D laboratories and production sites.



Policies



Communication

We believe active disclosure in communicating with stakeholders is part of the responsibility any enterprise owes to society.

Environmental Activities Report

Since 1998, Kuraray has been publishing an annual Environmental Activities Report to help people understand our programs and our commitment to environmental preservation. The Report is posted on our website as well.

The 2003 edition also features a social report, under the new title of the Kuraray Environmental and Social Report. We will improve this key tool for communication with our stakeholders to provide appropriate disclosure. In addition, each plant compiles an individual environmental report to brief visitors on their environmental initiatives.

Environmental Advertising

To enhance our corporate image as an "eco-friendly enterprise" through PR on our environmental initiatives, we advertise the Company and its products in newspapers, etc. One of our initiatives in this area is an exhibit of our wastewater treatment equipment at ATC Green Eco Plaza (Osaka Environmental Industry Promotion Center), providing many visitors a brief look at our environmental business.



Kuraray Booth at ATC Green Eco Plaza



Kuraray Booth at Water Expo

Exhibiting Products

We have exhibited our wastewater treatment equipment and systems at the Water Expo, one of the events concurrent with the 3rd World Water Forum, as well as at other locations.



Plant Tour

Plant Tours

As part of our initiatives for risk awareness communication, we organize plant tours for the residents of our host communities. The number of visitors is increasing every year. The tours include briefings on an overview of the plant, its initiatives and eco-friendly measures.

Visitor Traffic

Visitors	FY99	FY00	FY01	FY02
From host communities	1,384	1,744	2,013	2,075
Others	1,017	988	926	904

Report on Progress of measures for Flue Gas

We had complaints from the local residents near the Okayama Plant on the flue gas from our power generation boilers. We installed wet electrical dust facilities in two stages in 2001 and 2002, and kept residents briefed on the progress. We intend to take follow-up measures in order to maintain harmony with our host communities.

Data

History of Environmental Preservation and Safety Assurance Initiatives

Involvement in the Environment, Disaster Prevention, and Safety

- 1970 Specialized organizations responsible for environmental preservation and occupational safety established at head office and plants
- 1977 Regulations for Environmental Control and Occupational Safety established

Building a Foundation for Environmental Preservation

- 1991 Philanthropy and Environment Committee (and Ecology Subcommittee) established
- 1993 Kuraray Action Guidelines on the Global Environment established
- 1995 Participation begun in Responsible Care initiatives

Stepping Up Environmental Preservation Activities

- 1998 Efforts begun to obtain ISO14001 certification for all Kuraray plants and research laboratories
 - Kuraray Specialities Europe certified to ISO14001
- 1999 Kashima Plant and Techno Soft Co., Ltd. certified to ISO14001
- 2000 Eval Company of America certified to ISO14001
 - Okayama Plant and Nakajo Plant certified to ISO14001
 - Kurashiki Plant, Kuraray Tamashima Co., Ltd., Kuraray Saijo certified to ISO14001
- 2001 The Kuraray Group Action Guidelines on the Global Environment revised to encompass the entire Kuraray Group
 - The Medium-Term Environmental Plan formulated
 - The Environmental, Industrial Safety and Quality Management Department renamed The Environmental, Industrial Safety and Quality Management Center, and its functions upgraded
 - Responsible Care Initiatives Verification Meeting inaugurated
 - Tsukuba Research Laboratories certified to ISO14001
 - [All Kuraray plants and research laboratories in Japan complete the process of obtaining ISO14001 certification](#)
- 2003 Kuraray Plastics Co., Ltd. certified to ISO14001

Data on Main Sites

* Includes data on affiliated companies located on the same premises

The Okayama Plant

- (1) Address: 1-2-1, Kaigandori, Okayama City, Okayama Prefecture
 (2) Site area: 692,000 m²
 (3) ISO14001: Certified on March 24, 2000
 Certification No. JQA-EM0796

Main products:
KURALON, *KURALON K-II*,
CLARINO (man-made leather),
 poval resin,
EVAL resin and film,
KURAFLEX (dry-laid non-woven fabric)

	Unit	FY98	FY99	FY00	FY01	FY02	
Water consumption	1,000 m ³	28,932	29,383	28,717	27,052	25,817	
Wastewater volume	1,000 m ³	27,322	27,550	27,067	25,975	24,273	
COD volume	tons	336	336	303	322	313	
Energy consumption (crude oil equivalent)	1,000 kL	211	216	208	221	210	
CO ₂ emissions	1,000 tons - CO ₂	637	634	637	670	667	
SO _x emissions	tons	671	741	742	672	270	
NO _x emissions	tons	1,173	1,237	1,220	1,295	1,240	
Soot and dust emissions	tons	78	77	78	63	21	
Ozone-layer depleting substance emissions	tons - CFC equivalent	-	-	-	0.004	0.0004	
Substances covered by JCIA voluntary management	No. of items	20	19	31	31	31	
	Release	tons	2,079	1,956	1,470	1,275	1,097
	Transfer	tons	617	656	293	205	293
Substances covered by PRTR Law	No. of items	8	10	17	17	16	
	Release	tons	1,058	1,007	712	567	528
	Transfer	tons	341	355	96	93	110
Waste	Volume generated	tons	30,949	26,735	29,075	30,673	31,791
	Utilized internally	tons	4,730	5,057	5,081	3,847	4,484
	Utilized externally	tons	16,023	13,370	18,649	22,326	23,280
	Treated/Disposed internally	tons	6,706	5,800	4,767	4,150	3,592
	Treated/Disposed externally	tons	3,490	2,508	578	350	434

The Kurashiki Plant

- (1) Address: 1621, Sakazu, Kurashiki City, Okayama Prefecture
 (2) Site area: 668,000 m²
 (3) ISO14001: Certified on December 22, 2000
 Certification No. JQA-EM1213

Main products:
CLEARFIL and *EPRICORD* (dental materials),
 artificial kidneys,
 blood purifiers,
 contact lenses,
 industrial membranes

	Unit	FY98	FY99	FY00	FY01	FY02	
Water consumption	1,000 m ³	2,079	1,927	2,310	2,399	2,182	
Wastewater volume	1,000 m ³	1,940	1,848	1,852	1,752	1,560	
COD volume	tons	10	9	11	9	9	
Energy consumption (crude oil equivalent)	1,000 kL	8.9	9.1	9.1	8.9	8.7	
CO ₂ emissions	1,000 tons - CO ₂	19.1	19.1	19.4	19.4	18.3	
SO _x emissions	tons	3.0	3.0	3.0	3.9	5.5	
NO _x emissions	tons	71	72	67	66	73	
Soot and dust emissions	tons	1.0	1.0	1.0	1.2	0.8	
Ozone-layer depleting substance emissions	tons - CFC equivalent	-	-	-	0	0	
Substances covered by JCIA voluntary management	No. of items	20	9	21	22	16	
	Release	tons	113	107	114	100	79
	Transfer	tons	153	160	210	193	193
Substances covered by PRTR Law	No. of items	14	6	15	15	10	
	Release	tons	11	12	15	9	11
	Transfer	tons	30	18	41	38	28
Waste	Volume generated	tons	873	1,112	916	898	969
	Utilized internally	tons	144	163	272	203	193
	Utilized externally	tons	152	251	182	168	475
	Treated/Disposed internally	tons	122	0	20	39	30
	Treated/Disposed externally	tons	455	698	442	488	270

Kuraray Tamashima Co., Ltd.

- (1) Address: 7471, Tamashima-otoshima, Kurashiki City,
Okayama Prefecture
(2) Site area: 414,000 m²
(3) ISO14001: Certified on December 8, 2000
Certification No. JQA-EM1168

Main products:
Polyester staple

	Unit	FY98	FY99	FY00	FY01	FY02	
Water consumption	1,000 m ³	17,129	16,068	14,811	11,028	7,952	
Wastewater volume	1,000 m ³	13,870	13,290	10,607	7,711	6,724	
COD volume	tons	251	238	174	48	44	
Energy consumption (crude oil equivalent)	1,000 kL	57.7	57.1	41.2	38.4	42.4	
CO ₂ emissions	1,000 tons - CO ₂	211	211	179	142	163	
SO _x emissions	tons	179	170	111	52	33	
NO _x emissions	tons	126	157	122	94	77	
Soot and dust emissions	tons	9.0	6.0	4.5	2.9	1.0	
Ozone-layer depleting substance emissions	tons - CFC equivalent	-	-	-	0	0	
Substances covered by JCIA voluntary management	No. of items	9	10	9	7	9	
	Release	tons	140	88	15	1	3
	Transfer	tons	73	60	0	0	0
Substances covered by PRTR Law	No. of items	6	8	6	6	6	
	Release	tons	120	98	4	1	1
	Transfer	tons	72	59	0	0	0
Waste	Volume generated	tons	14,248	13,555	12,096	12,541	8,045
	Utilized internally	tons	1,427	1,624	2,890	343	338
	Utilized externally	tons	8,115	7,243	3,416	8,553	6,154
	Treated/Disposed internally	tons	2,359	1,558	1,009	2,770	552
	Treated/Disposed externally	tons	2,347	3,130	4,781	875	1,001

The Nakajo Plant

- (1) Address: 2-28, Kurashiki-machi, Nakajo-cho,
Kitakambara-gun, Niigata Prefecture
(2) Site area: 924,000 m²
(3) ISO14001: Certified on March 31, 2000
Certification No. JQA-EM0801

Main products:
Methacrylic resin for molding
poval resin,
aroma chemicals,
pharmaceutical and agrochemical intermediates

	Unit	FY98	FY99	FY00	FY01	FY02	
Water consumption	1,000 m ³	33,416	31,457	29,146	28,761	30,606	
Wastewater volume	1,000 m ³	34,156	31,937	30,076	29,009	29,216	
COD volume	tons	284	296	307	226	240	
Energy consumption (crude oil equivalent)	1,000 kL	93.6	92.1	88.6	88.6	90.5	
CO ₂ emissions	1,000 tons - CO ₂	256	249	236	216	213	
SO _x emissions	tons	1,689	1,574	1,567	1,459	655	
NO _x emissions	tons	356	310	284	289	183	
Soot and dust emissions	tons	77	49	30	39	23	
Ozone-layer depleting substance emissions	tons - CFC equivalent	-	-	-	0.53	0.50	
Substances covered by JCIA voluntary management	No. of items	32	30	56	43	37	
	Release	tons	775	764	667	593	532
	Transfer	tons	608	398	398	546	481
Substances covered by PRTR Law	No. of items	19	18	22	24	19	
	Release	tons	189	177	144	81	68
	Transfer	tons	0	1	8	16	28
Waste	Volume generated	tons	14,855	15,276	14,456	18,952	19,214
	Utilized internally	tons	4,461	4,355	3,269	4,523	4,652
	Utilized externally	tons	5,015	6,428	7,719	10,608	10,397
	Treated/Disposed internally	tons	3,570	3,275	2,711	2,150	2,303
	Treated/Disposed externally	tons	1,809	1,218	757	1,671	1,862

Data on Main Sites

* Includes data on affiliated companies located on the same premises

The Kashima Plant

- (1) Address: 36, Oaza-higashiwada, Kamisu-machi, Kashima-gun, Ibaraki Prefecture
 (2) Site area: 408,000 m²
 (3) ISO14001: Certified on March 12, 1999
 Certification No. JQA-EM0364

Main products:
 SEPTON and HYBRAR (thermoplastic elastomers),
 industrial cleaner

	Unit	FY98	FY99	FY00	FY01	FY02	
Water consumption	1,000 m ³	2,422	2,515	2,522	2,348	2,326	
Wastewater volume	1,000 m ³	2,719	2,660	2,587	2,739	2,540	
COD volume	tons	90	94	91	94	87	
Energy consumption (crude oil equivalent)	1,000 kL	56.0	60.0	57.1	57.0	60.5	
CO ₂ emissions	1,000 tons - CO ₂	171	178	173	168	193	
SO _x emissions	tons	0	0	0	0	0	
NO _x emissions	tons	51	46	54	54	47	
Soot and dust emissions	tons	7	9	11	9	7	
Ozone-layer depleting substance emissions	tons - CFC equivalent	-	-	-	0	0	
Substances covered by JCIA voluntary management	No. of items	21	21	27	28	29	
	Release	tons	413	527	744	591	475
	Transfer	tons	471	8	5	39	308
Substances covered by PRTR Law	No. of items	11	10	15	15	15	
	Release	tons	2	33	64	54	39
	Transfer	tons	70.5	1	5	8	52
Waste	Volume generated	tons	10,019	9,126	9,893	10,741	10,772
	Utilized internally	tons	66	34	46	45	6,094
	Utilized externally	tons	529	660	85	687	1,182
	Treated/Disposed internally	tons	8,581	8,112	9,240	9,799	3,402
	Treated/Disposed externally	tons	843	320	522	210	94

The Saijo Plant

- (1) Address: 892, Tsuitachi, Saijo City, Ehime Prefecture
 (2) Site area: 667,000 m²
 (3) ISO14001: Certified on December 15, 2000
 Certification No. JQA-EM1185

Main products:
 Polyester filament,
 polyarylate fiber,
 PVA films,
 GENESTAR (heat-resistant polyamide resin),
 PVA gel, melt-blown non-woven fabrics

	Unit	FY98	FY99	FY00	FY01	FY02	
Water consumption	1,000 m ³	15,188	12,968	11,563	13,088	12,778	
Wastewater volume	1,000 m ³	14,890	13,028	11,508	13,177	13,748	
COD volume	tons	59	57	40	59	60	
Energy consumption (crude oil equivalent)	1,000 kL	47.4	45.0	43.7	43.6	43.6	
CO ₂ emissions	1,000 tons - CO ₂	130	122	132	142	144	
SO _x emissions	tons	262	243	241	228	192	
NO _x emissions	tons	190	177	261	301	241	
Soot and dust emissions	tons	29	20	19	38	16	
Ozone-layer depleting substance emissions	tons - CFC equivalent	-	-	-	0	0	
Substances covered by JCIA voluntary management	No. of items	6	6	9	10	12	
	Release	tons	89	82	53	39	36
	Transfer	tons	110	456	524	302	96
Substances covered by PRTR Law	No. of items	4	4	5	5	7	
	Release	tons	27	17	4	2	5
	Transfer	tons	0	0	0	0	0
Waste	Volume generated	tons	10,636	10,504	8,197	4,906	5,069
	Utilized internally	tons	593	720	892	838	1,066
	Utilized externally	tons	8,291	8,001	5,754	3,393	3,805
	Treated/Disposed internally	tons	812	23	0	0	0
	Treated/Disposed externally	tons	940	1,760	1,551	675	198

The Tsurumi Plant, Kuraray Chemical Co., Ltd.

- (1) Address: 4342, Tsurui, Bizen City, Okayama Prefecture
 (2) Site area: 89,000 m²

Main products:
 Activated carbon,
 high performance activated carbon,
 nitrogen gas separators

	Unit	FY98	FY99	FY00	FY01	FY02	
Water consumption	1,000 m ³	-	-	828	828	878	
Wastewater volume	1,000 m ³	-	-	730	724	692	
COD volume	tons	-	-	4	4	3	
Energy consumption (crude oil equivalent)	1,000 kL	-	-	7.5	9.1	9.1	
CO ₂ emissions	1,000 tons - CO ₂	-	-	65.4	78.4	70.5	
SO _x emissions	tons	-	-	26.3	40.6	32.5	
NO _x emissions	tons	-	-	74	122	97	
Soot and dust emissions	tons	-	-	16	21	14	
Ozone-layer depleting substance emissions	tons - CFC equivalent	-	-	-	0	0	
Substances covered by JCIA voluntary management	No. of items	-	2	2	5	4	
	Release	tons	-	0	8.3	10.6	10.8
	Transfer	tons	-	0	0	0	0
Substances covered by PRTR Law	No. of items	-	0	0	2	2	
	Release	tons	-	0	0	0	
	Transfer	tons	-	0	0	3.7	0
Waste	Volume generated	tons	-	2,426	2,586	3,852	3,831
	Utilized internally	tons	-	0	0	820	836
	Utilized externally	tons	-	70	342	875	1,311
	Treated/Disposed internally	tons	-	147	140	79	27
	Treated/Disposed externally	tons	-	2,209	2,104	2,078	1,657

The Okayama Plant, Kuraray Trading Co., Ltd.

- (1) Address: 1099, Oaza-Kawabe Aza-Shinden, Mabi-cho, Kibi-gun, Okayama Prefecture
 (2) Site area: 5,780 m²

Main products:
 Industrial resin belts,
 flam resistance materials for fibers

	Unit	FY98	FY99	FY00	FY01	FY02	
Water consumption	1,000 m ³	-	-	2	2	2	
Wastewater volume	1,000 m ³	-	-	-	-	-	
COD volume	tons	-	-	0	0	0	
Energy consumption (crude oil equivalent)	1,000 kL	-	-	0.15	0.15	0.15	
CO ₂ emissions	1,000 tons - CO ₂	-	-	0.56	0.56	0.56	
SO _x emissions	tons	-	-	0	0	0	
NO _x emissions	tons	-	-	0	0	0	
Soot and dust emissions	tons	-	-	0	0	0	
Ozone-layer depleting substance emissions	tons - CFC equivalent	-	-	0	0	0	
Substances covered by JCIA voluntary management	No. of items	-	2	2	4	3	
	Release	tons	-	15.5	18	22.6	16.5
	Transfer	tons	-	1.4	1.4	0.5	0.2
Substances covered by PRTR Law	No. of items	-	1	1	2	1	
	Release	tons	-	0	0	7.9	5.9
	Transfer	tons	-	1.4	1.4	0.5	0.2
Waste	Volume generated	tons	-	-	26	32	26
	Utilized internally	tons	-	-	26	25	20
	Utilized externally	tons	-	-	0	0	0
	Treated/Disposed internally	tons	-	-	0	0	0
	Treated/Disposed externally	tons	-	-	0	7	6

Data on Main Sites

* Includes data on affiliated companies located on the same premises

The Ibuki Plant, Kuraray Plastics Co., Ltd.

- (1) Address: 4330, Osa, Tarui-cho, Fuwa-gun, Gifu Prefecture
 (2) Site area: 74,900 m²
 (3) ISO14001: Certified on January 17, 2003
 Certification No. JQA-EM2934

Main products:
 Hoses,
 laminates,
 driving pipes,
 compounds

	Unit	FY98	FY99	FY00	FY01	FY02	
Water consumption	1,000 m ³	-	-	1,225	1,168	1,018	
Wastewater volume	1,000 m ³	-	-	1,225	1,168	1,018	
COD volume	tons	-	-	1.4	1.2	0.7	
Energy consumption (crude oil equivalent)	1,000 kL	-	-	3.7	3.4	3.2	
CO ₂ emissions	1,000 tons - CO ₂	-	-	7.3	6.7	6.3	
SO _x emissions	tons	-	-	12.0	19.2	8.1	
NO _x emissions	tons	-	-	9.0	6.3	5.1	
Soot and dust emissions	tons	-	-	2.0	1.8	1.3	
Ozone-layer depleting substance emissions	tons - CFC equivalent	-	-	-	0	0	
Substances covered by JCIA voluntary management	No. of items	-	4	3	6	5	
	Release	tons	-	426	496	380	358
	Transfer	tons	-	0	0	57	55
Substances covered by PRTR Law	No. of items	-	4	3	4	3	
	Release	tons	-	426	496	75	6.7
	Transfer	tons	-	0	0	57	39.9
Waste	Volume generated	tons	-	585	970	1,078	1,096
	Utilized internally	tons	-	0	0	97	83
	Utilized externally	tons	-	100	701	980	959
	Treated/Disposed internally	tons	-	25	24	0	0
	Treated/Disposed externally	tons	-	460	245	1	54

The Hokkaido Plant, Kuraray Interior Co., Ltd.

- (1) Address: 194, Okayama, Mikasa City, Hokkaido Prefecture
 (2) Site area: 76,720 m²

Main products:
 Folkcraft furnitures

	Unit	FY98	FY99	FY00	FY01	FY02	
Water consumption	1,000 m ³	-	-	4	4	3	
Wastewater volume	1,000 m ³	-	-	4	4	3	
COD volume	tons	-	-	-	-	0	
Energy consumption (crude oil equivalent)	1,000 kL	-	-	0.6	0.6	0.5	
CO ₂ emissions	1,000 tons - CO ₂	-	-	1.4	1.4	1.3	
SO _x emissions	tons	-	-	1.0	1.0	1.7	
NO _x emissions	tons	-	-	3.3	3.3	2.6	
Soot and dust emissions	tons	-	-	1.0	1.0	0.8	
Ozone-layer depleting substance emissions	tons - CFC equivalent	-	-	-	0	0	
Substances covered by JCIA voluntary management	No. of items	-	2	5	4	4	
	Release	tons	-	19.0	19.9	15.4	9.2
	Transfer	tons	-	0	0	0	0
Substances covered by PRTR Law	No. of items	-	2	2	2	1	
	Release	tons	-	19.0	17.1	9.8	3.2
	Transfer	tons	-	0	0	0	0
Waste	Volume generated	tons	-	573	466	444	334
	Utilized internally	tons	-	0	0	399	292
	Utilized externally	tons	-	456	368	0	0
	Treated/Disposed internally	tons	-	0	3	0	1
	Treated/Disposed externally	tons	-	117	95	45	42

Magictape Co., Ltd.

(1) Address: 56, Noune, Maruoka-cho, Sakai-gun, Fukui Prefecture
 (2) Site area: 22,950 m²

Main products:
 MAGIC TAPE (hook and loop fastener),
 molded plastic hook and loop fastener

		Unit	FY98	FY99	FY00	FY01	FY02
Water consumption		1,000 m ³	-	-	17.6	17.6	5.8
Wastewater volume		1,000 m ³	-	-	17.6	17.6	5.8
COD volume		tons	-	-	4	4	0
Energy consumption (crude oil equivalent)		1,000 kL	-	-	2.3	2.3	0.99
CO ₂ emissions		1,000 tons - CO ₂	-	-	4.3	4.3	1.85
SO _x emissions		tons	-	-	0	0	0
NO _x emissions		tons	-	-	0	0	0
Soot and dust emissions		tons	-	-	0	0	0
Ozone-layer depleting substance emissions		tons - CFC equivalent	-	-	0	0	0
Substances covered by JCIA voluntary management	No. of items		-	4	6	4	6
	Release	tons	-	313.7	298.2	210	18
	Transfer	tons	-	30.0	29.4	29	9.1
Substances covered by PRTR Law	No. of items		-	2	2	2	4
	Release	tons	-	30.0	27.2	20	4.6
	Transfer	tons	-	0	0	3	2.4
Waste	Volume generated	tons	-	292	284	164	203
	Utilized internally	tons	-	10	10	69	70
	Utilized externally	tons	-	155	80	75	41
	Treated/Disposed internally	tons	-	23	0	0	0
	Treated/Disposed externally	tons	-	104	194	20	92

* The above figures also include data for Reihoku Textile Co., Ltd., which merged with Magictape Co., Ltd. in July 2002.

Overseas Affiliated Companies

Europe: EVAL Europe N.V.
 Kuraray Specialities Europe GmbH (certified to ISO14001 in November 1998)

North America: Eval Company of America (certified to ISO14001 in February 2000)
 SEPTON Company of America

		Unit	Europe		North America	
			FY01	FY02	FY01	FY02
Water consumption		1,000 m ³	395	455	799	927
Wastewater volume		1,000 m ³	1079	1,083	638	739
TOC emissions		tons	825	897	447	449
Energy consumption (crude oil equivalent)		1,000 kL	83	86	49	57
CO ₂ emissions		1,000 tons - CO ₂	205	214	113	132
SO _x emissions		tons	0	0	0	0
NO _x emissions		tons	0	0	0.2	0.4
Substances covered by PRTR Law	No. of items		8	8	4	8
	Release	tons	61	69	55	57
	Transfer	tons	364	114	223	278
Waste	Volume generated	tons	2,200	1,003	904	984
	Utilized internally	tons	0	0	0	0
	Utilized externally	tons	1,356	368	223	280
	Treated/Disposed internally	tons	0	0	0	0
	Treated/Disposed externally	tons	844	635	681	704

* Since TOC emissions are treated by outside wastewater treatment businesses, the amount of discharge to public water areas is substantially lower than the above figures.

* Data for overseas affiliated companies is not included in the Group Total figures on pages 8-23.

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