Kuraray Environmental and Social Report
2003
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.
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 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 (5).

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.
**Corporate Data**

### 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, Saito, Nakajo, Kashima, Tsukuba  
**Overseas Operations:** USA, Germany, Belgium, Singapore, China

### Financial Highlights

#### Net Sales

<table>
<thead>
<tr>
<th>Year</th>
<th>Non-Consolidated</th>
<th>Consolidated</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>$100 million</td>
<td></td>
</tr>
</tbody>
</table>

#### Operating Income

<table>
<thead>
<tr>
<th>Year</th>
<th>Non-Consolidated</th>
<th>Consolidated</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>$100 million</td>
<td></td>
</tr>
</tbody>
</table>

#### Net Income

<table>
<thead>
<tr>
<th>Year</th>
<th>Non-Consolidated</th>
<th>Consolidated</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>$100 million</td>
<td></td>
</tr>
</tbody>
</table>

#### Total Assets

<table>
<thead>
<tr>
<th>Year</th>
<th>Non-Consolidated</th>
<th>Consolidated</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>$100 million</td>
<td></td>
</tr>
</tbody>
</table>

### Sales by Geographic Segment

(consolidated, by customer location)

### Sales by Business Segment (consolidated)

Management Philosophy

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.

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.

Guidelines for Action

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

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.
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 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**: Composed 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.
Basic Approach to 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.

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
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 II

### 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

#### 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.

<table>
<thead>
<tr>
<th>Sites</th>
<th>Activities in Fiscal 2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Okayama</td>
<td>Model plant for zero emissions, 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</td>
</tr>
<tr>
<td>Model plant for energy conservation</td>
<td>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.</td>
</tr>
<tr>
<td>Kurashiki</td>
<td>Model plant for active promotion of LCA, 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&amp;D</td>
</tr>
<tr>
<td>Kuraray Tamashima</td>
<td>Model plant for ecology-related business promotion, Expansion of use of waste plastics as boiler fuel (28% of total fuel, up 5ppt YoY), Inaugural use of biomass fuels</td>
</tr>
<tr>
<td>Nakajo</td>
<td>Model plant for early adoption of regulations on total wastewater COD mass, 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 pyrolysis production process</td>
</tr>
<tr>
<td>Kashima</td>
<td>Model plant for active response to the PRTR Law, Installation of isoprene emission reduction devices, Consideration of efficient removal devices, presentation of cases to other divisions</td>
</tr>
<tr>
<td>Kuraray Saijo</td>
<td>Model plant for zero emissions and energy conservation, Zero surplus-sludge operations (two years)</td>
</tr>
</tbody>
</table>

* LCI (Life Cycle Inventory)
Environmental Preservation

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.

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.

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 the water levels at the purification plant to filter water, and so does away with the need for a booster pump.

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 though cooperation with our materials suppliers and customers.

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.

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.

Environmental Preservation Costs (millions yen)

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

Environmental Preservation Effect

1. Preconditions for assembling environmental accounting
   Period: April 1, 2002 – March 31, 2003
   Scope: Kuranay

2. 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.

3. 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.

4. 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 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)
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.
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

<table>
<thead>
<tr>
<th>Sites</th>
<th>Date obtained</th>
<th>(renewed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kashima Plant</td>
<td>Mar 1999</td>
<td>(Mar '02)</td>
</tr>
<tr>
<td>Okayama Plant</td>
<td>Mar 2000</td>
<td>(Mar '02)</td>
</tr>
<tr>
<td>Nakajo Plant</td>
<td>Mar 2000</td>
<td>(Mar '02)</td>
</tr>
<tr>
<td>Kurashiki Plant</td>
<td>Dec 2000</td>
<td></td>
</tr>
<tr>
<td>Tamashima Plant</td>
<td>Dec 2000</td>
<td></td>
</tr>
<tr>
<td>Sairo Plant</td>
<td>Dec 2000</td>
<td></td>
</tr>
<tr>
<td>Tsukuba Research Laboratories</td>
<td>Dec 2001</td>
<td></td>
</tr>
<tr>
<td>Techno Soft Co., Ltd.</td>
<td>Dec 1999</td>
<td>(Dec '02)</td>
</tr>
<tr>
<td>Kuraray Plastics Co., Ltd.</td>
<td>Jan 2003</td>
<td></td>
</tr>
<tr>
<td>Kuraray Specialities Europe</td>
<td>Nov 1998</td>
<td>(Feb '02)</td>
</tr>
<tr>
<td>Eval Company of America</td>
<td>Feb 2000</td>
<td>(Feb '02)</td>
</tr>
</tbody>
</table>

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.

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

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.
Working to Reduce Environmental Impact

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)

<table>
<thead>
<tr>
<th>Main Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eco-Friendly Areas</td>
</tr>
<tr>
<td>KURALON for fiber reinforced cement, EVAL (EVOH resin)</td>
</tr>
<tr>
<td>SEPTON and HYBRAR (thermoplastic elastomers)</td>
</tr>
<tr>
<td>Soft Methacrylic resin, GENESTAR (heat-resistant polyamide resin)</td>
</tr>
<tr>
<td>Environment Business Areas</td>
</tr>
<tr>
<td>Activated carbon, PVA gel, industrial membrane (hollow fiber membrane)</td>
</tr>
<tr>
<td>Water treatment system combining PVA gel and industrial membranes</td>
</tr>
</tbody>
</table>

**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.
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.
Working to Reduce Environmental Impact

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.

Emissions of Primary Ozone-Layer-Depleting Substances

<table>
<thead>
<tr>
<th>Substance Type</th>
<th>HCFC-123</th>
<th>HCFC-141a</th>
<th>HCFC-141b</th>
<th>HCFC-142b</th>
<th>HCFC-143b</th>
<th>HCFC-144</th>
<th>CFC-11</th>
<th>CFC-12</th>
<th>CFC-113</th>
<th>CFC-114</th>
<th>CFC-115</th>
</tr>
</thead>
</table>

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.

<table>
<thead>
<tr>
<th>Substance Type</th>
<th>HCFC-123</th>
<th>HCFC-141a</th>
<th>HCFC-141b</th>
<th>HCFC-142b</th>
<th>HCFC-143b</th>
<th>HCFC-144</th>
<th>CFC-11</th>
<th>CFC-12</th>
<th>CFC-113</th>
<th>CFC-114</th>
<th>CFC-115</th>
</tr>
</thead>
</table>

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, Seto Inland Sea), Accordingly, water quality regulations in the Special Law were revised and tightened.

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.

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

**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.

**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.

### Emissions of Greenhouse Gases Other than CO₂

<table>
<thead>
<tr>
<th></th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO₂</td>
<td>1.48</td>
<td>1.48</td>
<td>1.48</td>
<td>1.48</td>
</tr>
<tr>
<td>CH₄</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>N₂O</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>HFCs/HCs</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PFCs</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>SF₆</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

### Energy Consumption

![Energy Consumption Graph]

### CO₂ Emissions

![CO₂ Emissions Graph]
**Policies**

**Activities**

<table>
<thead>
<tr>
<th><strong>Reducing environmental impact during transport</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>In an attempt to reduce substances that impact the environment, such as CO$_2$ and NOx, 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 CO$_2$ and NOx emissions during transport by 15% and 10%, respectively, by fiscal 2005 (vs. fiscal 2000).</td>
</tr>
</tbody>
</table>

In fiscal 2002, our CO$_2$ emissions dropped 5.0% year-on-year to 25,732 tons, and NOx 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 NOx 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.

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

To reduce emissions of NOx 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.
Environmental Risk Management

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

<table>
<thead>
<tr>
<th>Substance</th>
<th>JCIA Voluntary Management Program</th>
<th>PRTR Law</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vinyl acetate</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Methanol</td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>

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).
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 remediated 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 alterations 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.
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

<table>
<thead>
<tr>
<th>Activities</th>
<th>Policies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume of Industrial Waste Processed by Outside Contractors</td>
<td>Efficient use of materials and reuse of packaging materials</td>
</tr>
<tr>
<td></td>
<td>Development of a zero surplus sludge system in treating wastewater</td>
</tr>
<tr>
<td></td>
<td>Efficient utilization of waste through separation</td>
</tr>
<tr>
<td></td>
<td>Thermal recycling by turning waste plastics into solid fuels</td>
</tr>
<tr>
<td></td>
<td>Efficient utilization of incinerator ash</td>
</tr>
<tr>
<td></td>
<td>Use of a resource-recycling waste treatment facility in Kurashiki City</td>
</tr>
</tbody>
</table>

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%.

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.
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

<table>
<thead>
<tr>
<th>Material/Service</th>
<th>Criteria Met</th>
<th>Main Suppliers 774</th>
<th>Criteria not met 57%</th>
<th>23%</th>
<th>9%</th>
<th>11%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uniforms and work clothes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Materials used to develop and manufacture products</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mechanical appliances used to develop and manufacture products</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Packaging materials and containers used for delivery and transport of products</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equipment and consumables used for marketing and administrative operations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outsourced business services, such as manufacturing, sales and logistics</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

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

**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.

**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

<table>
<thead>
<tr>
<th>Present Status of ISO9001 Certification</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
</tr>
</tbody>
</table>

- **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.

- **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.
Policies

Activities

**Initiatives to Assure Safety**

### 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)

![Graph showing occupational safety performance](image)

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

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.
### 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.

### 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

**Training Programs**

**Hierarchy style**
- Middle Forum
- Leader’s Forum
- 11th Year Career Guidance
- 7th Year Career Guidance
- 3rd Year Career Guidance
- Refresher Courses

**Selective style**
- Management School
- Advanced Leadership Course
- Beginning Leadership Course

**Cafeteria style**
- Business Training
- Systems Training Class
- Language Class (English Conversation, etc.)

**Managerial Position**
- Training for Promotion
  - Middle Forum
  - Leader’s Forum
  - 11th Year Career Guidance
  - 7th Year Career Guidance
  - 3rd Year Career Guidance
  - Refresher Courses

**Non-Managerial Position**
- Training for New Recruits
  - Management School
  - Advanced Leadership Course
  - Beginning Leadership Course

**Training for Promotion**
- Middle Forum
- Leader’s Forum
- 11th Year Career Guidance
- 7th Year Career Guidance
- 3rd Year Career Guidance
- Refresher Courses

**Language Class (English Conversation, etc.)**
- Business Training
- Systems Training Class
- Language Class (English Conversation, etc.)
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

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

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.

Recent themes

| 1 | The Story of Water: making banana juice transparent |
| 2 | The Story of Odors: making fragrances and making smelling substances |
| 3 | Making Fibers: making fibers from PET bottles, making paper from synthetic fibers |

Historical Data

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Classes</th>
<th>Number of Attendees</th>
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<tbody>
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<td>2030</td>
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</tbody>
</table>
Relationship with Society

**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.

**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.

**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.
Relationship with Society

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.

- **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 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**

<table>
<thead>
<tr>
<th>Month</th>
<th>Visitors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan</td>
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<td>Feb</td>
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<td>Mar</td>
<td></td>
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<tr>
<td>Apr</td>
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</tbody>
</table>

- **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.
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
### 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-
- CLARINO (man-made leather), poval resin,
- EVAL resin and film,
- KURAFLEX (dry-laid non-woven fabric)

### 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

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<table>
<thead>
<tr>
<th>Period</th>
<th>Plant 1</th>
<th>Plant 2</th>
<th>Plant 3</th>
<th>Plant 4</th>
<th>Plant 5</th>
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</thead>
<tbody>
<tr>
<td>Address</td>
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<tr>
<td>Site area</td>
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<tr>
<td>KURALON</td>
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<tr>
<td>KURALON K-</td>
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<tr>
<td>CLARINO</td>
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<tr>
<td>Poval resin</td>
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<td>EVAL resin</td>
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<td>Film</td>
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<tr>
<td>KURAFLEX</td>
<td></td>
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</table>
**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  

<table>
<thead>
<tr>
<th>Main products:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polyester staple</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>The Nakajo Plant</strong></th>
</tr>
</thead>
</table>

(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  

<table>
<thead>
<tr>
<th>Main products:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methacrylic resin for molding, pival resin, aroma chemicals, pharmaceutical and agrochemical intermediates</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Table</strong></th>
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<tbody>
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<tr>
<td><strong>Data</strong></td>
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<table>
<thead>
<tr>
<th><strong>Table (The Nakajo Plant)</strong></th>
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<tbody>
<tr>
<td><strong>Column</strong></td>
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<tr>
<td><strong>Row</strong></td>
</tr>
<tr>
<td><strong>Data</strong></td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Main products</th>
<th>SEPTON</th>
<th>HYBRAR</th>
<th>industrial cleaner</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>

### 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, GENESTAR (heat-resistant polyamide resin), PVA films, PVA gel, melt-blown non-woven fabrics

<table>
<thead>
<tr>
<th>Main products</th>
<th>Polyester filament</th>
<th>Polyarylate fiber</th>
<th>GENESTAR</th>
<th>PVA films</th>
<th>PVA gel</th>
<th>Melt-blown non-woven fabrics</th>
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</tbody>
</table>
### The Tsurumi Plant, Kuraray Chemical Co., Ltd.

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

<table>
<thead>
<tr>
<th><strong>Main products:</strong></th>
<th>Activated carbon, high performance activated carbon, nitrogen gas separators</th>
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</thead>
</table>

<table>
<thead>
<tr>
<th><strong>Address</strong></th>
<th><strong>Site area</strong></th>
<th><strong>Main products</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Tsurumi Plant</td>
<td>89,000 m²</td>
<td>Activated carbon, high performance activated carbon, nitrogen gas separators</td>
</tr>
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</table>

### The Okayama Plant, Kuraray Trading Co., Ltd.

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

<table>
<thead>
<tr>
<th><strong>Main products:</strong></th>
<th>Industrial resin belts, flam resistance materials for fibers</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th><strong>Address</strong></th>
<th><strong>Site area</strong></th>
<th><strong>Main products</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Okayama Plant</td>
<td>5,780 m²</td>
<td>Industrial resin belts, flam resistance materials for fibers</td>
</tr>
</tbody>
</table>
### 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

<table>
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<tr>
<th>Product Groups</th>
<th>Nitrile</th>
<th>Chloroprene</th>
<th>EPDM</th>
<th>SIS</th>
<th>Butyl</th>
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<tbody>
<tr>
<td>Hoses</td>
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<tr>
<td>Laminates</td>
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<tr>
<td>Driving pipes</td>
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<tr>
<td>Compounds</td>
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### The Hokkaido Plant, Kuraray Interior Co., Ltd.

1. **Address:** 194, Okayama, Mikasa City, Hokkaido Prefecture
2. **Site area:** 76,720 m²

<table>
<thead>
<tr>
<th>Product Groups</th>
<th>Nitrile</th>
<th>Chloroprene</th>
<th>EPDM</th>
<th>SIS</th>
<th>Butyl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Folkcraft furnitures</td>
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</table>
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

<table>
<thead>
<tr>
<th>Country</th>
<th>North America</th>
<th>Europe</th>
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<td>Overseas</td>
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<tr>
<td>Magictape Co., Ltd.</td>
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</tbody>
</table>

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

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