



**Environmental and Social Responsibility Report**

*2 0 0 4*

## Editorial Policy

This Environmental and Social Responsibility Report has been published to present Shin-Etsu Chemical's current environmental activities, and previous performance. This year's report highlights activities at Shin-Etsu Handotai Co., Ltd. and its Shirakawa Plant (page 23). In addition, the name of this report has been changed to the Environmental and Social Responsibility Report to reflect the addition of information regarding our corporate social responsibility (CSR) activities to the environmental report published previously.

## Contents

Greetings from the President and CEO	1
Environmental Management	2
Promoting Environmental Management	3
Environmental Management Activities in Fiscal 2003	4
Environmental Management Indicators in Fiscal 2003	6
Eco-products and Technology	10
Social Responsibility	14
Ensuring Safety	17
Comfortable Working Conditions	19
Exchange with Local Communities	21
Production Diagram for Major Products	22
Outline of Environmental Management Activities at Shin-Etsu Handotai Co., Ltd.	23
History of Environmental Activities	28
Corporate Profile	29

## GREETINGS FROM THE PRESIDENT AND CEO



The 21st Century is often referred to as “the Century of the Global Environment.” Corporate activities must always take into account environmental impact on a global basis. In consideration of “Safety and Environmental Protection First” in this Century of the Global Environment, the Shin-Etsu Group always advances its business activities by setting realistic management targets for ensuring safety and prioritizing environmental preservation.

The Shin-Etsu Group is actively promoting ecological preservation through its environmental management activities. These include the prevention of atmospheric pollution and water degradation, the imposition of restrictions on the release of harmful substances, and the development of eco-products that conserve energy and resources as well as reduce negative environmental impact.

In 1998, the Shin-Etsu Group adopted an Environmental Charter that offered guidelines for the promotion of environmental management. All of the major manufacturing facilities of the Shin-Etsu Group in Japan, as well as overseas, have since acquired ISO 14001 certification, the international standard for environmental management systems.

With recent attention focusing on corporate social responsibility, corporations are expected to address the needs of a diverse range of stakeholders and disclose appropriate information in a timely manner. Shin-Etsu is stepping up its efforts to contribute to society as a concerned corporate citizen while conducting positive activities in local communities.

This Environmental and Social Responsibility Report—previously called the Environmental Report—has been drawn up to describe and explain our environmental protection activities as well as our corporate social responsibility initiatives. It is our sincere hope that this report will deepen the understanding of these activities by our customers, shareholders and investors as well as the people in the communities near Shin-Etsu’s facilities.

As members of the Shin-Etsu Group, we firmly believe that environmental protection is the most important challenge we face, now and in the future. At each of our manufacturing facilities and business locations throughout the world, we seek to fulfill our duties as a good corporate citizen, maximizing our efforts to protect local communities as well as the global environment.

Chihiro Kanagawa,  
President and CEO  
October 2004

# ENVIRONMENTAL MANAGEMENT

The Shin-Etsu Group adopted its Environmental Charter in August 1998, in pursuit of the realization of a sustainable society. This Charter sets forth environmental management guidelines for the entire Group to follow in the course of its global expansion. Following the management goal of “Safety and Environmental Protection First,” we have developed its business with due consideration to safety and protection of the environment.

Each of our plants devises its own environmental policy based on the Environmental Charter, tailors it to the characteristics of the local region and executes environmental management measures. In addition, comprehensive safety measures have been implemented to prevent fires that cause substantial environmental damage and pose a threat of injury or loss of life.

## ENVIRONMENTAL CHARTER

### Fundamental Principle

Shin-Etsu Chemical Co., Ltd. recognizes global environmental protection as one of the most important issues facing humankind. Shin-Etsu believes in the fundamental principle of giving environmental consideration to every aspects of its business activities as it aims at contributing to a society in which sustainable development is possible.

### Action Guidelines

**1**

Shin-Etsu organizes and promotes environmental protection to enable it to carry out its operations effectively.

**2**

Shin-Etsu aims to accurately assess any environmental effects caused by its business activities and establish technically viable objectives focused on the reduction of waste and harmful materials, the conservation of resources and energy, and the recycling of materials. Shin-Etsu regularly revises its goals to pursue continual improvements in its environmental performance.

**3**

Shin-Etsu observes all applicable regional, national, and international laws, regulations, and agreements related to the environment. Moreover, Shin-Etsu also establishes its own standards to prevent environmental pollution.

**4**

Shin-Etsu strives to instill a better understanding among all employees of its environmental charter and raise awareness of environmental issues through education and internal communications. Shin-Etsu promotes environmental protection activities from a wide-ranging point of view, expanding from small regional communities to the entire global society.

**5**

Shin-Etsu aims to assess environmental-friendliness in developing new products and technologies, from fundamental research and design to manufacture, distribution, usage, and disposal, in an effort to minimize any adverse environmental effects.

# PROMOTING ENVIRONMENTAL MANAGEMENT

The aim of Shin-Etsu's environmental management is to contribute to the creation and continuous improvement of a sustainable society while striving for a constructive cycle between the environment and corporate management. In our manufacturing and research and development activities, we aim to reduce environmental impact and improve resource efficiency in addition to developing and providing materials that are gentle on the environment. By improving these technologies and by emphasizing coexistence with local communities and training for the strict observance of related laws and regulations we are able to promote continuous advancements in our innovative environmental technologies and carry on our tradition of caring for the environment.



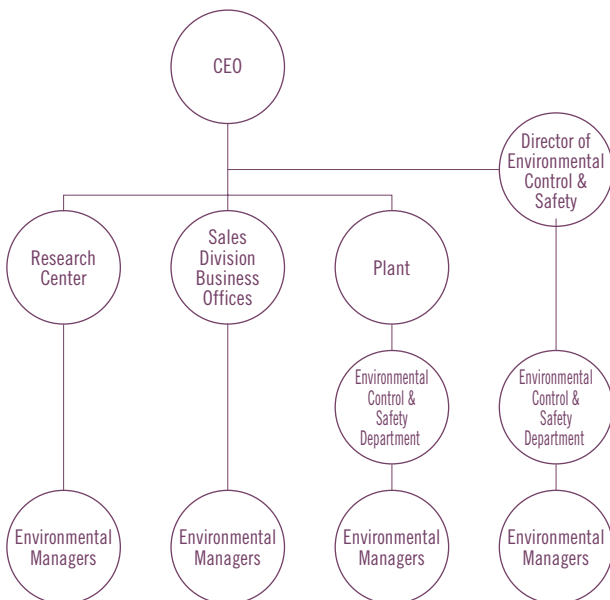
**Kiichi Habata**  
Director in Charge of Environmental Control & Safety

## THE ORGANIZATION AND SYSTEMS OF ENVIRONMENTAL MANAGEMENT

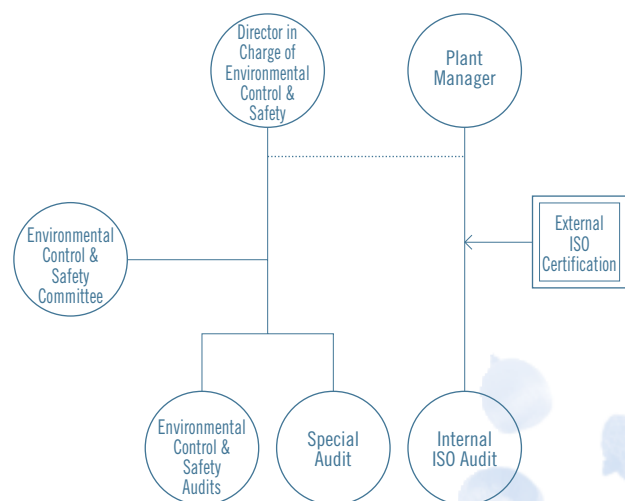
Shin-Etsu established its Environmental Control & Safety Committee, chaired by the Director in Charge of Environmental Control & Safety to address specific issues related to environmental management. Environmental management policies and targets, health and safety guidelines, and related matters are coordinated by the Environmental Control & Safety Department at corporate headquarters.

Regular environmental safety inspections and special audits are also conducted to ensure proper administration of environmental protection and safety activities. The environmental control & safety department at each plant provides technological support regarding environmental protection to the various manufacturing departments, and handles all relations with external institutions, such as local government bodies, relevant government agencies and industry associations.

### Organization



### Committee and Auditing System



# ENVIRONMENTAL ACTIVITIES IN FISCAL 2003

Shin-Etsu's environmental management systems are built around the participation of all employees in environmental management. In pursuit of environmental protection programs suited to our production sites, in July 1996, our Gunma Complex attained ISO 14001 certification, the international standard for environmental management systems. All our domestic plants completed certification in 2000, and we are rapidly moving toward completion of the certification of our primary subsidiaries and overseas manufacturing bases.

Under our environmental management system, our plants are constantly engaged in improving activities to protect the environment and reduce the environmental burden of their operations by setting environmental targets particular to their manufacturing facilities. (For further information on the ISO 14001 status of Shin-Etsu and its principal subsidiaries, see page 29.)

## INTERNAL AUDIT AND INSPECTION SYSTEMS

Shin-Etsu has adopted audit and inspection systems to ensure that environmental management systems conform to the highest standards of environmental protection and safety.

### Environmental Control and Special Audits

Shin-Etsu's audit teams are committees composed of technical and safety experts, led by the Director in Charge of Environmental Control and Safety. The teams conduct on-site inspections of environmental protection programs, results achieved and problems encountered, and check records for accuracy and completeness. Special audits are conducted on individual environmental issues. Reports of these inspections are circulated to all executives and to the inspected plants, and problems identified are tracked until shown to be resolved upon a subsequent inspection.

### Safety Inspection Committee

Shin-Etsu's safety inspection committees are composed of plant managers and key personnel. These committees inspect the installation and safety performance of new facilities utilizing Hazard and Operability study (HAZOP\*) and other studies to identify areas for improvement in an effort to further raise environmental protection and safety.

### Labor and Management Safety Patrols

Shin-Etsu's key labor and management personnel periodically carry out patrols to check safety conditions at existing plant facilities.

### Self-Monitoring and Audit Programs

(Number of cases)

Fiscal year	'99	'00	'01	'02	'03
Environmental control & safety audits	12	12	8	8	9
Safety inspection committees	48	50	50	40	44
Labor/management safety patrols	30	30	23	27	42
Number of HAZOP studies	38	35	27	66	66

#### \* Hazard and Operability Study (HAZOP)

HAZOP's are designed to allow improvement in work procedures and facilities by anticipating potential malfunctions in manufacturing facilities and the resultant environmental pollution brought on by changes to operating conditions. HAZOP's are conducted when a new facility is in the design stage, and are done by the designers and facility managers to ensure that a high degree of safety is designed into the facility. Existing facilities are also subject to HAZOP's, in which their operators participate, and this is reflected in improvements to operating procedures and facilities.

## ENVIRONMENTAL ACCOUNTING

Shin-Etsu's environmental accounting tallies the expenses incurred and investments made in efforts to reduce the environmental burden from air and water pollution, noise, vibration and waste disposal; measures to conserve energy; and initiatives to increase recycling.

We have invested a cumulative total of approximately ¥16.9 billion in environment-related activities over the past ten years. Major investments during this period are presented as follows:

- Upgraded wastewater treatment facilities at the Naoetsu Plant and Takefu Plant
- Installed waste processing facilities at the Naoetsu Plant and Kashima Plant
- Upgraded the industrial waste disposal site at the Gunma Complex
- Installed energy conservation and recovery facilities at the Gunma Complex and Kashima Plant
- Upgraded environmental countermeasures at manufacturing facilities at the Takefu Plant and Kashima Plant
- Installed other facilities and equipment to reduce gaseous emissions, and introduced cogeneration systems



Waste disposal facility

We have also compiled details of investments and expenses related to environmental protection for fiscal 2003 in accordance with environmental accounting guidelines stipulated by the Ministry of the Environment.

### Environmental Costs in Fiscal 2003

(Millions of Yen)

Category	Details	Investment	Expenditure
Business area costs			
Pollution prevention cost	Air, water, noise and other types of pollution prevention measures	263	3,047
Global environment conservation cost	Energy conservation and global warming prevention measures	252	416
Resource circulation cost	Waste prevention, recycling and other measures	431	1,528
Upstream and downstream costs	Green purchasing and container and packaging measures	0	3
Administration cost	Environmental management, monitoring environmental impacts and education measures	0	304
Research and development cost	Environmentally conscious product and process research and development	0	528
Social activity cost	Donations and contributions to environment protection	0	227
Environmental remediation cost	Assessment, handling and other costs related to environmental degradation	0	132
Total		946	6,185



Water treatment facility



Waste emission treatment facility

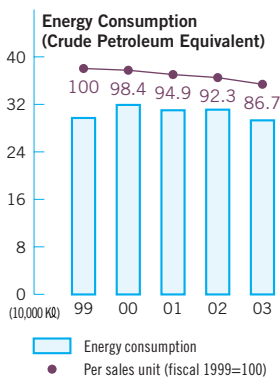
# ENVIRONMENTAL MANAGEMENT INDICATORS IN FISCAL 2003

Shin-Etsu makes every effort to reduce environmental burden, preserve the global environment and promote resource recycling. We report the results of these efforts in a variety of management indicators. For reference, we have compiled historical five-year data on management indicators and sales unit weightings.

In 2003, we are pleased to report that we did not violate any environmental laws or regulations and did not have any environmental accidents.

## ENERGY CONSERVATION AND THE PREVENTION OF GLOBAL WARMING

### Energy Conservation

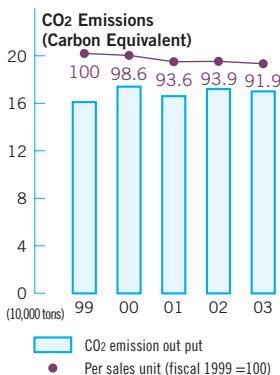


Shin-Etsu consumes both thermal energy and electrical energy in synthesis, purification and various other manufacturing processes. To use the world's resources wisely, we have adopted various methods and diversified technologies to more efficiently use and conserve energy. These measures include:

- Introducing cogeneration systems
- Increasing the efficiency of heating and cooling method processes
- Collecting synthetic response heat and recycling it as steam
- Reducing electrical power consumption by adopting a highly effective refrigerator.

In fiscal 2003, these efforts resulted in energy consumption equivalent to 294,000 kiloliters of crude oil, a saving of 17,000 kiloliters compared with the previous fiscal year. On a sales unit basis, we achieved energy savings of 19,000 kiloliters.

### Prevention of Global Warming

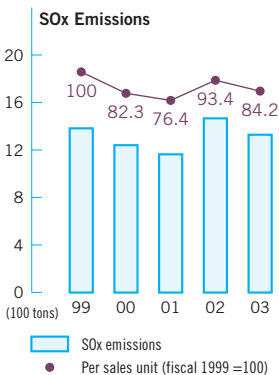
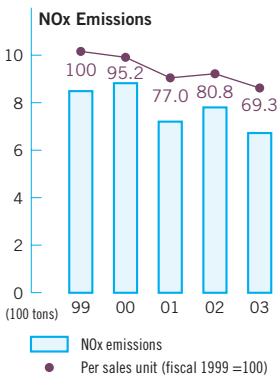
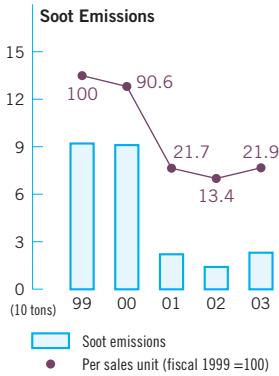


Shin-Etsu is working to minimize emissions of CO<sub>2</sub>, methane, CFCs and other "greenhouse gases" that cause global warming. In 1995, we completely ceased all use of those CFCs that have a harmful effect on the ozone layer.

We are strongly promoting the use of cogeneration systems, more efficient energy utilization and at the same time, the reduction of CO<sub>2</sub> emissions and other greenhouse gases. In fiscal 2003, CO<sub>2</sub> emissions were the approximate equivalent of 170,000 tons of carbon, an increase of 800 tons over the past five years. On a sales unit basis, however, CO<sub>2</sub> emissions were reduced by 8% over the same period.



## Preventing Air Pollution



Shin-Etsu is working to reduce the emission of air pollutants through equipment upgrades and scheduled inspections, and to reduce the environmental impact of our operations through improving facilities and switching to low-polluting fuels.

Our boilers primarily burn fuel oil, which gives off CO<sub>2</sub>, NO<sub>x</sub>, SO<sub>x</sub> and soot. In addition, our plants incinerate the by-products, waste solvents, sludge and rubbish that is generated from manufacturing activities. The incinerator stack gases also contain CO<sub>2</sub>, small amounts of NO<sub>x</sub> and SO<sub>x</sub>, soot, and extremely small quantities of dioxins.

Shin-Etsu regularly monitors and analyzes these gas emissions to ensure compliance with statutes and regulations governing pollutant concentrations. In addition, the switch to high-grade fuels is reducing the quantity of NO<sub>x</sub> and SO<sub>x</sub>, while improvements to combustion efficiency and augmentation of pollution control equipment are bringing reductions in soot and dioxin emissions.

Production increases result in temporary increases in gaseous emissions. Accordingly, we are working diligently to gradually reduce the emission of pollutants. In fiscal 2003, the amount of soot was 23 tons, NO<sub>x</sub> was 672 tons and SO<sub>x</sub> was 1,328 tons.

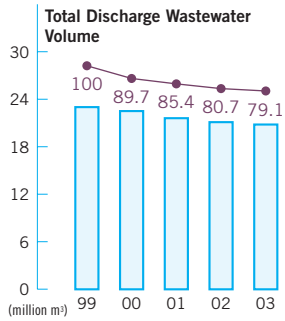
### Boiler Exhaust Analysis Results

Fiscal year	Government requirement	'99	'00	'01	'02	'03
Soot (g/Nm <sup>3</sup> )	<0.25	<0.02	<0.21	<0.01	<0.045	<0.02
NO <sub>x</sub> (ppm)	<230	<150	<190	<190	<220	<115
SO <sub>x</sub>	<17.5	<15	<12.4	<9.2	<10	<1.2

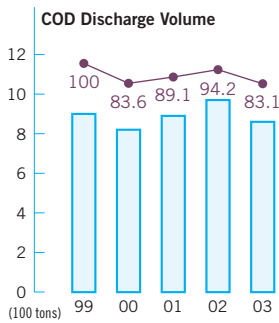
### Incinerator Exhaust Analysis Results (Gunma Complex)

Fiscal year	Government requirement	'99	'00	'01	'02	'03
Soot (g/Nm <sup>3</sup> )	<0.15	<0.1	<0.1	<0.01	<0.01	<0.03
NO <sub>x</sub> (ppm)	<250	<100	<100	<100	<100	<90
SO <sub>x</sub>	<17.5	<1	<1	<1	<1	<1
Hydrogen chloride (mg/Nm <sup>3</sup> )	<700	<300	<200	<51	<74	<54
Dioxins (ng/Nm <sup>3</sup> )	<5	<0.01	<0.01	<0.01	<0.01	<0.01

## Preventing Water Pollution



Legend: Total discharge wastewater volume (blue bar), Per sales unit (fiscal 1999=100) (purple line with dot)



Legend: COD discharge volume (blue bar), Per sales unit (fiscal 1999=100) (purple line with dot)

Shin-Etsu practices the efficient disposal of wastewater and monitors the pH of final effluent with the aim of stabilizing wastewater quality and to protect the river environment.

Most of the water used by our plants is process water used in the manufacture of its products and in cleaning, or is cooling water for machinery. No water is discharged until it is confirmed to be within the standards set forth in the Water Pollution Control Law and other applicable regulations.

In fiscal 2003, we reduced total discharge volume through recycling efforts and other measures to conserve water. Moreover, despite fluctuation from one year to the next, the upgrade of wastewater treatment facilities is contributing to an overall decline in chemical oxygen demand (COD) discharge volume.

\* Chemical Oxygen Demand (COD):

This is the amount of oxygen required to degrade the organic compounds of wastewater. A bigger COD value means more-polluted wastewater.

### Wastewater quality monitoring at the Gunma Complex

Wastewater analysis results	Wastewater standard	'99	'00	'01	'02	'03
pH*	5.8-8.6	6.2-7.0	6.7-6.9	6.1-7.4	6.6-7.4	6.8-7.3
BOD*(ppm)	<25.0	<3.5	<3.3	<6.0	<18.0	<22.0
SS*(ppm)	<50.0	<6.8	<6.0	<15.0	<44.0	<41.0

\* Potential of Hydrogen (pH):

This is a unit of hydrogen ion exponent ( $\log [H^+]$ ) that indicates whether a solution is acidic (less than pH 7), neutral (pH 7) or alkaline (more than pH 7).

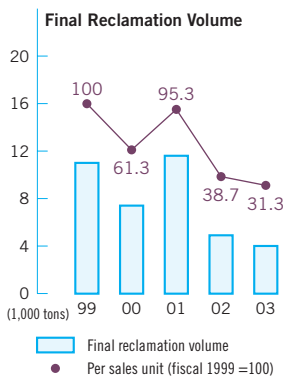
\* Biochemical Oxygen Demand (BOD):

This indicates the amount of oxygen required for water-borne micro-organisms to break down contaminants in water. This value is a measure of the degree of water pollution.

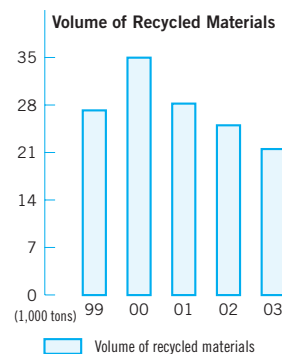
\* Suspended Solids (SS):

These are organic and mineral particles that are suspended in water. They are a major cause of turbidity, and have a significant impact on aquatic life.

## Reducing Industrial Waste



Legend: Final reclamation volume (blue bar), Per sales unit (fiscal 1999=100) (purple line with dot)



Legend: Volume of recycled materials (blue bar)

Shin-Etsu promotes recycling and reuse while controlling emissions of waste generated by its manufacturing activities. Each plant discharges industrial waste in the form of secondary material by-products and solvents such as organic and inorganic sludge, and oil and acid waste produced from non-reactive materials and reactive chemicals.

In fiscal 2003, we worked actively to reduce waste toward its environmental management targets through efforts to collect and reuse commercial metals, commence cement stabilization of inorganic waste and recycle waste acid. As a result, we were successful in significantly reducing the volume of final disposal waste to slightly under 4,000 tons.



## OTHER ENVIRONMENTAL PROTECTION ACTIVITIES

### **Reduction of Vibrations and Noise**

Shin-Etsu conducts scheduled measurements of vibrations and noise at specified points around the boundaries of its plants to ensure compliance with standards. We also analyze the data gathered to assist in our planning for the installation of noise abatement equipment and the upgrade of machinery that create vibrations.

Some of our manufacturing facilities have received complaints about vibrations and noise, and in response we are redoubling efforts to further reduce vibrations and noise while explaining the situation in detail to affected parties.

### **Environmental Education**

To convey the importance of environmental protection, Shin-Etsu trains all personnel in the provisions of its Environmental Charter and the environmental policies of each plant. We also provides training in the importance of recycling, the separation of waste materials, the preservation of natural environments and the effects of destruction of the ozone layer.

Specialized training is held for personnel whose functions can have significant effects on the environment, such as emergency response personnel and wastewater management personnel. This training requires specialized knowledge, and leads to technical qualifications.

Specialized Knowledge and Technical Qualifications:

- To manage industrial waste materials
- To manage wastewater quality
- To manage exhaust gas
- To develop high pressure (HP) gas safety technology
- To handle hazardous materials
- To handle toxic chemicals

### **Participation in Industry-Level Environmental Activities**

Shin-Etsu is a member of the Japan Chemical Industry Association, Vinyl Environmental Council (VEC), the Plastic Waste Management Institute, and other groups. We participate in chemical substance management and research activities, public relations to promote a correct understanding of PVC, and efforts to improve industrial waste disposal and recycling technology.





## ECO-PRODUCTS AND TECHNOLOGY

Because the Shin-Etsu Group is the largest manufacturer of polyvinyl chloride in the world, it is often thought of as a manufacturer of petrochemicals. On the contrary, the primary raw material in products such as silicone (silicone resin) and synthetic quartz, which is used to make optical fibers, is silicon, a material that is abundantly present in nature.

In addition, the composition ratios of salt and petroleum in chlorinated vinyl are 57 % and 43 %, respectively, indicating that the petroleum content is remarkably low compared with other plastic products.

The following table identifies representative products, from among the numerous products and materials produced by the Shin-Etsu Group, that contribute to reducing environmental burden.

There are many types of ecological functions a product can provide, such as resource and energy efficiency, effective use of easily recyclable materials, control of harmful emissions, conservation of petroleum resources, or integration with the ecosystem. By providing these products, Shin-Etsu seeks to reduce the overall burden on the environment, and to contribute to the conservation of petroleum and other natural resources.

Products	Usage	Ecological function	Point of products
Polyvinyl chloride 	Polyvinyl chloride materials in general (production process)	Energy saving	The material comprises salt (57%) and petroleum (43%); the ratio of petroleum is lower in comparison with other plastic products, with minimal adverse environmental effects in the life cycle assessment (LCA)* in comparison with other materials.
	Products such as chlorinated vinyl sash	Energy saving	Compared with other materials, is better able to insulate against heat; accordingly, enables the saving of fuel for air conditioners and electric power.
	Products such as chlorinated tube	Excellent durability	Compared with other materials, is more durable in general.
Silicone Typical form of silicone Form of silicone oil  Form of silicone resin  Form of silicone rubber 	Silicone For plastic (modified resin)	Reduces adverse effects on the environment	By not using environmentally hazardous substances, improves safety and is superior to recyclability.
	For tires (modified rubber)	Energy saving, improvement in fuel charge countermeasures, dust	By improving fuel charges, enables a reduction in the amount of CO <sub>2</sub> , nitrogen oxides (NO <sub>x</sub> ), and sulfur oxides (SO <sub>x</sub> ), etc., that are generated, and consequently helps prevent global warming and environmental pollution.
	Water-repellent agent construction	Reduces adverse effects on the environment, harmonization with ecosystem	By not using environmentally hazardous substances, improves safety.
	Lubrication oil	Energy saving	Superior to lubrication in low temperature.
	For addition to paints	Resource saving	Superior to corrosion resistance and weather resistance.
	LIMS (for liquid silicone, injection molding system)	Energy saving	Energy saving in the process of molding and increase in productivity.
For heat radiation and insulation	Energy saving and resource saving	Efficient in energy saving and reduces the quantity of CO <sub>2</sub> , resulting in the minimal use of products.	
For hardening of UV (ultraviolet rays)	Energy saving, non-solvent agent	Saves more energy compared with heat curing type products.	
Non-solvent type products (for release paper, etc.)	Reduces adverse environmental effects, non-solvent agent	Use of both a solvent agent and dilution solvent are unnecessary, and consequently there is a reduction in capacity and saving of energy at the stage of transportation. Organic solvent is not used, thus the product is safe for humans. Enables a reduction of adverse effects on the environment involving discharge into the atmosphere.	

\* Life Cycle Assessment (LCA):

Method to evaluate the degree of environmental influence in the process of production through collection and reuse

Products	Usage	Ecological function	Point of products
Synthetic pheromones 	Mating disruptant	Harmonization with ecosystem, ecological agrochemicals	This product is a synthetic natural substance with minimal toxicity that decomposes into water and carbon dioxide in the natural environment, making it more environmentally friendly compared with earlier agrochemicals.
Cellulose derivatives 	Admixture for underwater concrete	Water pollution control, improving the workplace environment	Increases the viscosity of concrete, preventing water pollution during construction in the water. We have developed technologies that lower the volume of dust stirred up when concrete is sprayed onto tunnel walls.
Rare earth magnets 	Compressor motors for air conditioners	Resource saving, compact in size, energy saving	Reduces annual electric power consumption. Reduces the quantity of lead.
	Wind-power motors	New energy	Compared with thermal power generation, enables a reduction of the amount of CO <sub>2</sub> , nitrogen oxides (NO <sub>x</sub> ), sulfur oxides (SO <sub>x</sub> ), etc., that are generated, and consequently helps prevent global warming and environmental pollution.
	Electric vehicle motors	Clean energy	Compared with gasoline, enables a reduction of the amount of CO <sub>2</sub> , nitrogen oxides (NO <sub>x</sub> ), sulfur oxides (SO <sub>x</sub> ), etc., that are generated, and consequently helps prevent global warming and environmental pollution.
Epoxy-molding compound 	Resin encapsulating material for semiconductors	Controls chemical substance generation	We achieved the highest standards in flame retardation (UL-94 V-0 standard) by introducing a proprietary flame retardant system that uses silicon technology and does not use halogen or antimony compounds, which harm the environment.
Hot melt adhesives* 	Magazine recycling	Resource conservation	It is now possible to achieve 100 % recycling, including those parts of magazines that could not previously be recycled, such as those containing glue.
Polypropylene (PP) Film 	Microwave oven condensers	Conserves resources	An alternative to conventional condensers using paper, helping to conserve forest resources.

\* We use environmentally friendly hot melt adhesives in the 2005 Shin-Etsu Calendar.

## Eco-Friendly Products ①

## Polyvinyl Chloride



## POLYVINYL CHLORIDE SASH

Since polyvinyl chloride is durable against corrosion and climate, it is used widely in the field of architecture. Above all, vinyl sash is remarkable because of its ability to keep a room warm, preserve heat, and reduce noise.

## Ecological Performance

This material offers superior heat retention, more than 1,000 times greater than aluminum. When used as a window frame, it can reduce to around half the energy consumption required for heating and cooling compared with our previous products. Consequently, it can save energy equivalent to 436 liters of lamp oil (per household annually). It is commonly used overseas as a material for window frames, especially in environmentally advanced Germany, where the ratio of its usage is over 50%. Use of this material is also growing in Japan, mainly in cold weather regions.

Further information in Japanese on polyvinyl chloride sashes can be found on the Web site of the Polyvinyl Chloride Sash Promotion Committee ([www.jmado.jp](http://www.jmado.jp))

## Comparison of the Degree of Heat Temperature Decrease (Aluminum Sash + Single-Layer Glass = 100)

Polyvinyl chloride sash + highly heat-preserved multiple-layer glass	35.7
Wooden sash + highly heat-preserved multiple-layer glass	35.7
Aluminum combined vinyl sash + multiple-layer glass	53.5
Aluminum sash + multiple-layer glass	71.4
Aluminum sash + single-layer glass	100

Source: Japan Building Material Industry Association, "Promotion of Energy Saving Building Materials Diffusion Center."

## Eco-Friendly Products ②

## Silicone



## SILICONE FOR ECO-PLASTIC

Silicone applications for plastics modification are being developed in a variety of fields. A representative example is Nucycle, a product jointly developed and manufactured by NEC Corp. and Sumitomo Dow Ltd. This eco-plastic, containing an additive of silicone flame retardant jointly developed by NEC and Shin-Etsu, is used in the housing of liquid crystal displays and the bodies of personal computers.

## Ecological Performance

Nucycle, containing a new type of silicone flame retardant agent, provides even greater flame retardancy than plastics incorporating toxic substances such as halogen (bromine) and phosphorus, and is significantly more shock resistant. Moreover, because Nucycle retains its flame retardant properties after recycling, it can be reused as a material in electronic devices, such as the body of a PC, greatly contributing to the realization of a recycling-oriented society.

## Eco-Friendly Products ③

## Synthetic Pheromones



## DISRUPTING INSECT MATING BEHAVIOR

Insecticides are essential to the efficient production of agricultural crops. However, their overuse can have many negative effects. Synthetic pheromones have attracted attention around the world as a revolutionary alternative to conventional insecticides, and are used in agricultural regions that produce apples, peaches, pears, or grapes in not only Japan but also in Europe and the United States.

## Ecological Performance

Once placed in orchards, synthetic pheromones effectively reduce the numbers of destructive insects by inhibiting their mating behavior throughout the season. Synthetic pheromones have a very low impact on commercial crops and livestock, and residual substances are not a problem as with insecticides. Shin-Etsu boasts the number one share of world market for synthetic pheromones.

## Eco-Friendly Products ④

## Epoxy Molding Compounds



## EPOXY ENCAPSULATION MATERIALS FOR SEMICONDUCTORS

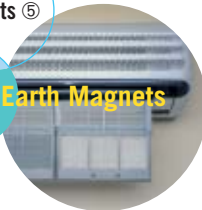
Epoxy encapsulation materials protect semiconductor chips from external contamination, moisture and changes in temperature, these epoxy encapsulation materials make sure semiconductors function properly. Our epoxy sealants for semiconductors are well regarded for their reliability.

## Ecological Performance

Conventional epoxy molding compound (EMC) contains bromine and antimony as flame retardants. As an environmentally friendly product, green EMC does not use these ingredients and retains the same flame retardant properties. In addition, there are an increasing number of customers adopting lead-free soldering processes to help conserve the environment, requiring even higher thermal resistance than conventional EMC. Shin-Etsu has met these higher requirements by improving its formulation.

## Eco-Friendly Products ⑤

## Rare Earth Magnets



## AIR-CONDITIONING COMPRESSOR MOTORS

Rare earth magnets are high-performance, permanent magnets made from neodymium, samarium, or other rare earth elements. They possess a strong magnetic power, and are commonly used in hard disk drives, stereo headphones, and motors for factory automation (FA) and office automation (OA) equipment. They are also found in air-conditioning compressors, for which a highly efficient motor is essential, and are highly regarded as a part of a new type of energy-saving motor.

## Ecological Performance

The size and weight of air-conditioning compressor motors can be reduced with the use of rare earth magnets. Such motors are only 85% the capacity and weight of conventional motors, and use 40% less copper wire.

The coefficient of performance (COP) was improved approximately 5% to 10%, and the power consumption greatly reduced, which helps save energy, reduce CO<sub>2</sub> emissions, and prevent global warming.

## Weight Comparison of Compressors (kg)

New-type DC twin	6.5
Ordinary DC twin	8.2
Ordinary AC twin	10

Cooperation: Sanyo Denki Co., Ltd./ Sanyo Denki Kucho Co., Ltd.

Magnetic compressor



(Rare earth)ND-type magnetic rotor (motor thickness -50%)

Copper wire use -40%



New-type DC motor (CWM)

Ordinary DC motor

Ordinary AC motor

## SOCIAL RESPONSIBILITY

Corporate scandals, environmental issues and other problems that have seriously affected corporate value are also regarded as social problems. The Shin-Etsu Group considers the safety of its plants and the protection of the environment important management issues, and while emphasizing social responsibility, ensures compliance in management by conducting internal audits and instilling respect for laws and regulations.

### OBSERVING LAWS AND REGULATIONS


The Shin-Etsu Group has set forth the management objective of contributing to all facets of society, including local communities, through fair corporate behavior based on respect for laws and regulations. Observing laws and regulations is a duty that must naturally be fulfilled through interactions with society. For Shin-Etsu, observing laws and regulations is a crucial prerequisite to making every effort to increase corporate value and meet the expectations of all its stakeholders, including local communities, customers, suppliers, shareholders and investors.

Interest in corporate social responsibility has grown in recent years, and companies are expected to constantly strive to fulfill their social responsibilities. Heeding this trend, we intend to thoroughly review our structure for observing laws and regulations in the event of a major social issue or accident. We are making concerted efforts to ensure the establishment of a robust structure for observing laws and regulations by providing related information internally and conducting training sessions when necessary.

### COMPLIANCE

As a part of efforts to further instill compliance management, in February 2003 the Shin-Etsu Group formulated the Compliance Oath, a promise between the directors, employees and the Company, to heighten the awareness of each director and employee with regard to compliance issues. Moreover, in March 2003, the Company initiated the Compliance Consultation Office to raise awareness of the social responsibility of each employee and to support activities for the strict observation of laws, regulations and Company rules. The Compliance Consultation Office serves as means for resolving whether the business practices of employees are in compliance with legal and social ethical standards. In addition, the Compliance Consultation Office also provides a hotline for reporting inappropriate business behavior or related problems.

We are promoting compliance management through these and other effective initiatives.





## COMPLIANCE OATH

**The Compliance Oath is a declaration and promise of each director and employee to conduct their daily business activities within the bounds of compliance.**

**The important portions of the Compliance Oath are as follows:**

- I will obey all laws and regulations, ethical standards, and Company regulations, and perform my work for the Company in accordance herewith. I acknowledge that any violation of laws or regulations, ethical standards, or Company regulations is not allowed, even if done for the sake of the Company.
- In the process of performing my work, I will give priority to the safety of people, maintaining people's health, and the protection of the environment.
- I will not engage in insider trading using the internal business information of the Company or any entity/person with which the Company does business.
- In making decisions relating to the Company, I will comply with all Company decision-making guidelines and internal rules and all relevant laws and regulations and will take such actions based on the appropriate materials and procedures.
- I will select and treat all customers and vendors with sincerity and fairness. I will not attempt to treat unfairly for convenience or make unfair demands on customers and vendors.

## CORPORATE GOVERNANCE

In order to spur business development and receive management advice from a broader perspective, Shin-Etsu has welcomed outside directors with extensive experience to the Board of Directors. Currently, two of our 14 directors are outside directors. In addition, in an aim to reinforce auditing functions, three of our four auditors, including statutory auditors, are outside auditors. We aim to establish a flexible management structure and accelerate decision-making by keeping the number of directors to a minimum. The Company has also established the Director Compensation Committee, headed by an outside director, to deliberate and determine director compensation.

## PROPER HANDLING OF CHEMICALS

Many chemical substances are harmful to the environment and people's health and are therefore subject to a variety of laws and regulations. Shin-Etsu uses numerous chemicals in its manufacturing processes and accordingly adheres strictly to regulatory requirements. We have always exercised close control over the chemicals we use and have a variety of safeguards in place to prevent accidents or discharge into the environment.

We report on manufacturing volumes of new specific chemical substances\* and trace amounts of new specific chemical substances\* in accordance with the Industrial Safety and Health Law and the Law Concerning the Examination and Regulation of Manufacture etc. of Chemical Substances. As prescribed under the PRTR Law\*, we participate in the self-management program of the Japan Chemical Industry Association. Moreover, our Naoetsu and Kashima plants are cooperating with the national and prefectural governments' pilot program, and implementing systems to report accurately and at the same time to reduce the release of specific chemical substances through closed system manufacturing facilities and installing incineration equipment for gaseous emissions.

To ensure safety and environmental protection through proper handling of chemical substances, We have implemented a Material Safety Data Sheet (MSDS) system. We prepare an MSDS for each product, and, to aid safety and environmental protection, provide them to employees and users. We receive MSDSs from suppliers of raw materials, and use them in practice for proper handling by employees.

We also prepare Yellow Cards as safety and environmental measures during the transportation of chemical substances, and they are handed to truck drivers in case of an emergency during transportation.

\* New Specific Chemical Substances

The Law Concerning the Examination and Regulation of Manufacture, etc. of Chemical Substances and the Labor Safety and Sanitation Law create reporting duties with respect to new specific chemical substances.

\* Small Amount of New Specific Chemical Substances

These are new specific chemical substances that are subject to the reporting requirements of the two laws mentioned above, but which are produced or handled in small amounts.

\* The PRTR Law is the Law Concerning Reporting, etc. of Release to the Environment of Specific Chemical Substances and Promoting Improvements in Their Management.

### Change in Activities Relating to Control of Chemical Substances

(Number of cases)

Fiscal year	'99	'00	'01	'02	'03	
MSDS prepared	6,900	7,000	8,000	8,282	9,461	
Yellow cards issued	100	120	178	118	108	
Substances subjected to PRTR notification requirement	60	64	62	66	115*	Report to industry group on the status of self-management
New Specific Chemical Substances	562	535	576	588	651	Total number of cases regarding the Law Concerning the Examination and Regulation of Manufacture, etc. of Chemical Substances, and the Labor Safety and Sanitation Law
Small Amount of New Specific Chemical Substances	16	5	23	11	11	Total number of cases regarding the Law Concerning the Examination and Regulation of Manufacture, etc. of Chemical Substances, and the Labor Safety and Sanitation Law

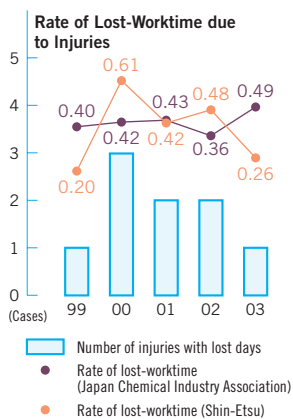
\* The number of chemical substances subject to PRTR notification increased as a result of revisions to the minimal quantity required for notification from five tons to one tone.

# ENSURING SAFETY

At Shin-Etsu, the preservation of the environment and the maintenance of safety are always before us, and are priorities second to none in our business operations. We believe it is our responsibility as a firm to provide a safe working environment for our employees, and to ensure the safety of local residents and affiliated companies. The fundamental philosophy of our business activities is to place "Safety and Environment Protection First."

## SAFETY AND OCCUPATIONAL HEALTH

### Safety Programs



Shin-Etsu is utilizing safety inspection committees to maintain safety within our facilities, and the HAZOP method to institute improvements to our facilities and industrial processes. Our periodic safety patrol and safety suggestion programs have also made numerous contributions to this effort. As a result, our frequency rate of Lost Time Injury (LTI), which refers to the number of injuries from disasters and accidents per one million man-hours, is about 0.26, and this rate is better than the industry average.

### Occupational Health Programs

Shin-Etsu provides employees with regular physical examinations, and has made improvements to the working environment to prevent occupational illnesses. Mental health support is also available.

### Zero Accident Programs

Since fiscal 2002, Shin-Etsu's three-year plans have incorporated "zero accident programs" to reduce accidents due to human error. In fiscal 2003, we implemented a hazard awareness program, implemented risk assessment, safety patrols and programs to prevent accidents to encourage greater attention to safety on the part of each employee. Increasing sensitivity to hazards will not only prevent industrial accidents and increase operational safety, but will also prevent environmental incidents.

## ENVIRONMENTAL PROTECTION AND SAFETY IN THE LOGISTICS STAGE

Every facet of the Shin-Etsu Group's shipping operations, from the parent company, Group shipping subsidiaries, through external contractors, is working to reduce environmental impact. These measures include shortening shipping routes, creating a new logistics system that combines truck and railway shipping, and increasing the efficiency of product delivery systems. Efficiency in shipping operations has also reduced CO<sub>2</sub> emissions and contributed to energy conservation. Yellow cards\* are provided to drivers of trucks transporting hazardous materials. These cards set forth proper measures to be taken in case of traffic accidents or other emergencies, contributing to the safe transport of these materials. We are also taking steps to provide container yellow cards for the transport of small quantities of hazardous materials.



Tanker truck for use of integrated transport system

Moreover, we are implementing education programs for drivers in the event they are involved in a traffic accident or emergency, installing emergency equipment in vehicles, and establishing an emergency support network.

\* Yellow cards

Issued to the drivers of vehicles transporting hazardous materials, yellow cards give information on safety and the handling of hazardous materials.

## EMERGENCY RESPONSE

A large-scale disaster at any one of Shin-Etsu's plants would have a potential impact on not only Shin-Etsu's employees but also on surrounding areas. Should such an accident or a large-scale earthquake occur, we have established effective emergency response procedures and conduct periodic emergency drills to ensure their effectiveness.

Emergency drills are conducted at each of our plants, as well as at each department, to ensure appropriate action is taken in the event of a disaster such as fire, explosion or a leak of hazardous materials. Drivers are also provided with emergency equipment in the event of an accident during transportation.

With regard to recent accidents, both domestic and overseas, we have:

- Established a redundant emergency communication system in the event of large-scale earthquake
- Used simulation software to perform a quantitative evaluation of the damage done
- Strengthened our crisis communication capabilities through the establishment of systems to disseminate information to regional citizens
- Installed emergency equipment in all appropriate locations including a support network outside the Company's premises
- Upgraded the yellow card information system and provided training in how to respond in emergency situations

# COMFORTABLE WORKING CONDITIONS

The Shin-Etsu Group strives to create a workplace environment that is comfortable, and aims to create a personnel system that emphasizes the individuality of each employee and encourages self-realization and career advancement.

## INTRODUCTION OF RESULTS-ORIENTED PERSONNEL SYSTEM

In 1998, the Shin-Etsu Group conducted a thorough review of its personnel system, and decided to create a new system that fairly reflects performance and ability while not discriminating in terms of age, academic history or other personal characteristics. In addition, the Company is starting the application of a results-oriented compensation system, instead of a seniority-based system, from the current fiscal year. We are working to establish a personnel system that spurs sustainable growth for both employees and the Company by reflecting outstanding results in employee's compensation with the achievement of challenging objectives.

To appropriately administer a results-oriented personnel system, it is necessary to clarify performance standards and build a framework for fairly reviewing personnel. To this end, We are training all management to fairly evaluate personnel. We are using personnel evaluations as a tool for not only measuring employee performance, but also for encouraging the development of personnel resources through on-the-job training. As a part of this initiative, we are clearly identifying the expectations of managers and the hopes of employees through the creation of communication sheets for managing personal objectives and developing skills, as well as through one-on-one interviews twice a year. While aiming to facilitate communication between the evaluator and the evaluated through these measures, we also set objectives to encourage personal growth and enhance employee skills and their appetite for taking on challenges. At the same time, employees evaluate themselves every six months, raising awareness of their career progress within the Company. Through accelerated promotions based on ability, we also aim to place the best personnel in optimal positions without regard for age or other factors.

## TRAINING AND EDUCATIONAL SYSTEM

The Shin-Etsu Group is enhancing its training and educational system to improve the skills of each employee. We offer management training, training for different employee ranks, such as junior leader training for mid-tier employees, and specialized training such as languages and culture to foster employee's astuteness in international business.

To support the career advancement of individuals, we have set up a reimbursement system when employees acquire public qualifications, a classroom support system for distance education and e-learning, and a two-year overseas study abroad system.

One highlight of our training and educational system is a study program for allowing approximately 10 employees, mostly operators from our manufacturing plants, to attend classes at university for one year. This study program was initiated in 1962 as a means to increase the knowledge of mid-rank employees to take corporate growth to the next level. In the 42 years since its launch, 455 employees have finished the study program and returned to work as leaders in their workgroup.



Junior leader training



International training

## RESPECT FOR HUMAN RIGHTS

The Shin-Etsu Group respects the personalities and rights of individuals, and makes every effort to create a work environment of mutual trust that bars discrimination on the grounds of race or sex. The Human Rights Enlightenment Promotion Committee is the organization in charge of training all employees and promoting respect for human rights. The Company is also promoting barrier-free facilities by installing slopes and handrails at its business location in an effort to make a working environment easier for handicapped people to access. During the Athens Paralympics held in 2004, some employees participated as a wheelchair rugby team.



Human Rights Training



Barrier-free facilities with slopes

## WELFARE

Shin-Etsu has established a framework for welfare programs to create an amiable workplace. For employees that are willing to continue working but must temporarily leave the workplace to attend to family matters such as raising children or care giving, we have established systems for taking maternity leave, raising children and caring for family members in need. We have also created systems that allow employees to use paid holidays for taking time off to care for family members through a fund that supplements paid vacation. Accumulated leave can also be used for taking time off for personal injury or illness, and in the event that a personal injury or illness leads to extended leave and lower income, we provide insurance that pays out 10% of standard wages for as long as until the employee reached 60 years of age. In 1989, we recognized commuting by Shinkansen bullet train as a reimbursable expense to provide employees with greater opportunity to buy their own homes. This has also helped to ease employee transfers from our offices in Gunma and Fukushima to corporate headquarters by not changing living environments. In addition, in the event that an employee passes away, we have established funds for supporting the lifestyles of their surviving families and systems for supporting surviving children.



Many employees use Shinkansen bullet trains for commuting to work

## MENTAL HEALTH CARE

The Shin-Etsu Group has medical rooms in each of its offices to provide health checkups, health guidance and mental health care for improving the health of its employees. For mental health care in particular, we offer one-on-one and telephone consultations with external professionals including clinical psychologists and industrial counselors. We do our best to create a framework for helping employees vent their concerns in order to help prevent and treat mental distress.



Managing health with physical fitness tests



Health advice at the medical office

## EXCHANGE WITH LOCAL COMMUNITIES

The Shin-Etsu Group aims to contribute to the creation of an abundant society through various activities with local communities and society at large, while pursuing its mission of satisfying customers around the world through its business activities. Our activities vary at each business office, such as participating in the promotion of a triathlon at our Kashima Plant, providing funds for youth development sporting activities at our Takefu Plant, sponsoring events that enrich the community, and proactively participating in cleanup campaigns. Here, we introduce the highlights of our activities to preserve the environment, ensure safety and interact with local communities.

### Explorers Arrive at Shin-Etsu Handotai Co., Ltd.'s Shirakawa Plant



A team of little explorers visited Shin-Etsu Handotai Co., Ltd.'s Shirakawa Plant. A five-minute walk from the plant, Odagura Elementary School sent ten students from the second grade to explore the area around their school as a part of a class assignment. The students drew sketches and wrote essays on pretty

red and pink flowers growing in the surrounding natural environment, which covers more than 50% of the total site area for the Shirakawa Plant.

### Naoetsu Plant Cooperates in Collection and Reuse of Pens and Pencils at the Joetsu Chamber of Commerce and Industry



At the request of the Joetsu Chamber of Commerce and Industry, the Naoetsu Plant is cooperating in the collection of pens and pencils left forgotten in desk drawers, and has collected approximately 2,500 so far. The Joetsu Chamber of Commerce and Industry has sent more than 39,000 usable pens

and pencils collected from companies and individuals to children in Nepal and Mongolia.

### Kashima Plant Promotes Interaction with Local Residents



The Kashima Plant is cooperating with companies in eastern Kashima in a consortium to exchange information on disaster-prevention measures and environmental measures, as well as share survey results and engage in joint training. In 2003, as the lead company in the consortium, we made concerted

efforts to promote interaction with local residents, such as holding periodic town meeting and coordinating schedules. In addition, we participate in responsible care activities with the Japan Chemical Industry Association, and as a part of these activities we are building a structure for providing information about the Kashima consortium to local residents, including information on disaster-prevention measures.

### Local Junior High School Students Visit Their Parents at Work (Gunma Complex)

Students from a junior high school near the Gunma Complex were given an opportunity to visit their parents at work. This has become customary, as students enjoy learning more about what their parents do. At our Silicone-Electronics Materials Research Center, students participated in some simple experiments and study.



We opened up the Silicone-Electronics Materials Research Center to the families of employees working there, and they participated in experiments for popping bubbles with silicone bubble-popping solution, experiments for confirming the water-shedding characteristics of silicone, and hands-on learning such as mold tracing. These activities provided children with an excellent opportunity to see their parents at work.

### Takefu Plant Backs 2004 Magnet Contest

The Takefu Plant, which produces rare earth magnets, helps sponsor a magnet contest held at the Fukui National College of Technology. In December 2003, the ninth award ceremony was held at the Fukui Chamber of Commerce and Industry to recognize 15 outstanding achievements, including one grand idea prize, one runner-up idea prize and four honorable mention prizes, from among the nearly 800 submissions from elementary school students all the way up to college students. Four elementary and junior high schools were also selected for school prizes by way of recognition for fielding the most submissions. Submissions were accepted from September 1, 2004 to September 30, 2004.



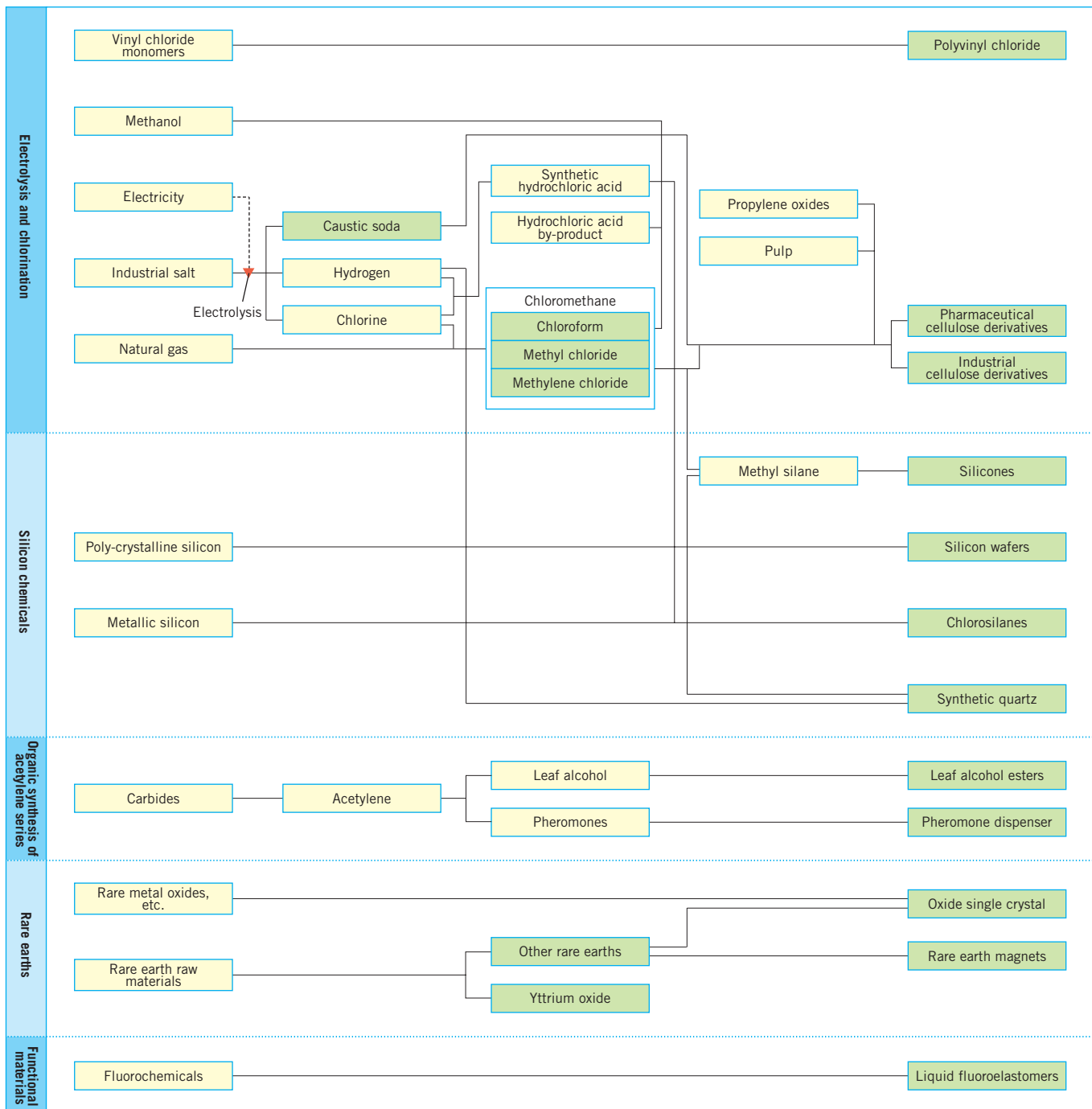
### Takefu Plant Employees Volunteer to Help in Fukui Flood Areas

In July 2004, the northern part of Fukui Prefecture was hit by a downpour of rain that caused five missing or dead persons, 17 injuries, the destruction of homes and water damage to buildings. Approximately 15,000 homes were affected by the typhoon. While the Takefu Plant and Group companies located in Takefu City escaped damage, rivers burst their banks in Fukui City and other areas, causing water damage to the floors of approximately 60 employee homes. Right after the disaster, coworkers of these employees with flooded homes helped to clear mud and debris, and more than 100 employees volunteered to help flood areas recover through mainly working to clear sediment from roads and private homes during the weekend.



# PRODUCTION DIAGRAM FOR MAJOR PRODUCTS

The Shin-Etsu Group aims to expand beyond its role as a chemical manufacturer to become a producer of various high-tech materials as well. At present, it produces polyvinyl chloride, silicones, semiconductor silicon, synthetic quartz, methyl cellulose derivatives, rare earth magnets, and various other products.





# OUTLINE OF ENVIRONMENTAL MANAGEMENT ACTIVITIES AT SHIN-ETSU HANDOTAI CO., LTD.

We would like to take this opportunity to introduce the principal environmental activities of Shin-Etsu Handotai Co., Ltd., a primary subsidiary, to highlight the environmental efforts at our main plants. First, we will take a look at the environmental management activities at the Shirakawa Plant and then describe our fundamental philosophy, policies and benchmarks for environmental and safety management.

## FUNDAMENTAL PHILOSOPHY AND POLICIES OF SHIN-ETSU HANDOTAI GROUP ON ENVIRONMENTAL MANAGEMENT



Fumio Akiya President

Shin-Etsu Handotai (SEH) engages in the semiconductor wafer business as a primary subsidiary of the Shin-Etsu Group, supplying products to semiconductor device manufacturers from its production sites around the world. We boast the world's largest share of the market for semiconductor wafers. Promoting global business development, we consider environmental management one of our most important management issues based on our Environmental Charter and philosophy of engaging in corporate activities that benefit the world and people. While striving to constantly improve its environmental systems, we take an integrated approach to the environment, safety and cleanliness based on related laws and regulations, customer requests and internal policies governing environmental preservation and management. By 1997, we had acquired ISO 14001 certification, the international standard for environmental management systems, at all of our plants and continue to promote environmental management.

### Fundamental Philosophy Behind Environmental and Safety Management

By producing semiconductor silicon and compound semiconductors, the "gift of the earth to mankind," the Shin-Etsu Handotai Group aims to contribute to the development of an electronics-rich society, or a silicon society, through the stable supply of high-quality wafers to users around the world.

To fulfill this objective, we have positioned environmental and safety management as a foremost management priority, based on our philosophy of engaging in corporate activities that benefit people and in order to create a sustainable society the world over.

### Environmental and Safety Management Policies

#### Observation of Laws and Regulations Related to Environmental and Safety Management

SEH strictly observes laws and regulations related to environmental, safety and hygiene management in all of its business activities.

#### Manufacturing Activities that Emphasize the Environment and Safety

SEH follows regulations governing environmentally harmful chemical substances while making every effort to conserve resources and energy, prevent environmental pollution and reduce, reuse, and recycle waste over a broad spectrum of manufacturing activities ranging from material procurement to product disposal.

#### Implementation of Environmental Management Systems

SEH is building and operating environmental management systems that conform to environmental and safety regulations, policies, objectives and targets. We conduct periodic internal environmental and safety audits in an aim to continuously improve our environmental and safety management systems through a review of these audits by top management.

#### Ensuring Operational Safety and Employee Safety, Hygiene and Health

SEH makes concerted efforts to ensure the safety of its employees by developing and deploying easy-to-use equipment with failsafe features to ensure operational safety. We work to maintain and enhance the health of our employees as well as ensure clean workplaces.

#### Abundant Educational Opportunities

Aiming to improve employee awareness of the environment, safety and hygiene, SEH provides educational opportunities for all employees and informs them of activities related to environmental management as well as safety and hygiene management.

#### Business Activities in Tune with Local Communities

All SEH sites are committed to maintaining good relationships with their local communities through business activities in order to minimize environmental impact. The safety and environmental management policies of each site are available to the public on request.

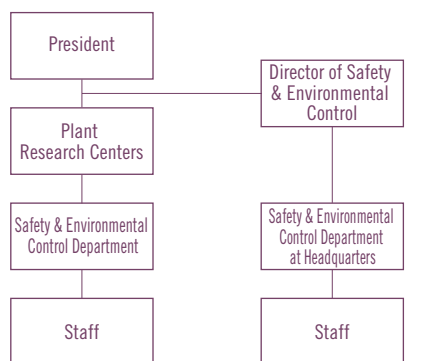
## ENVIRONMENTAL MANAGEMENT STRUCTURE



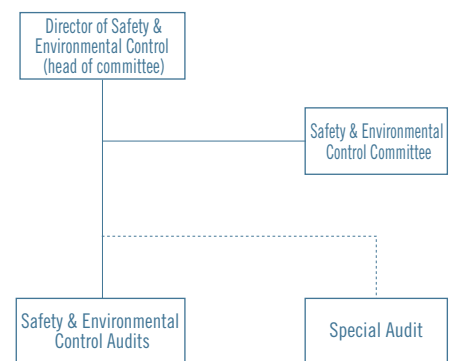
**Kenji Sugii**  
Director of Safety &  
Environmental Control

The Shin-Etsu Handotai Group has established a Safety & Environmental Control Committee, headed by a director, to deliberate and decide on items pertaining to environmental and safety management. At the start of each year, the committee studies annual environmental and safety management activities, environmental and safety audit reports, related laws and global trends, and then formulates environmental and safety management plans that become guidelines. Based on these guidelines, each site coordinates with the offices of Shin-Etsu Chemicals and closely follows the laws of their respective countries when engaging in activities based on these guidelines. The results of environmental and safety management activities are reported monthly to the Safety & Environmental Control Committee at each site, and also confirmed in an environmental and safety audit once a year, in an aim to improve and invigorate such activities within the Shin-Etsu Handotai Group.

### Organization



### Environmental Control & Safety Committee and Auditing System



## Environmental Management Activities at SEH

A defining attribute of environmental management at SEH is its overriding aim to contribute to the reduction of environmental impact and risk in business activities, the reduction of environmental impact in society through advanced technological development, and the improvement of resource efficiency. As such, we acquired ISO 14001 certification at an early stage. In addition to these activities, we conduct thorough preventive safety reviews, including environmental precautions, in all of our manufacturing processes.

### Mr. Ogihara, manager of the Safety & Environmental Control Department at Headquarters, tells us about environmental programs at SEH.



Water treatment facilities  
at the Shirakawa Plant

We have thoroughly worked at environmental management to strictly comply with environmental and safety reviews from legal and technological perspectives at our domestic and overseas manufacturing sites. In particular, the production of silicon wafers requires the use of electricity, natural gas, water and chemicals. Accordingly, we manage our facilities in terms of saving energy and resources and undertake technological reviews of exhaust gas and wastewater treatment.

We have four plants in Japan. The Isobe Plant, which mainly produces epitaxial wafers and compound semiconductors, is located in Annaka City, Gunma Prefecture. Located in Takefu City, Fukui Prefecture, the Takefu Plant specializes in the manufacture of silicon single crystals using the CZ method. The Shirakawa Plant, located in Nishigo Villiage, Nishi-Shirakawa County, Fukushima Prefecture, is an integrated production facility for single silicon crystals up to 300-millimeter wafers. Situated in Kubiki Village, Nakakubiki County, Niigata Prefecture, the Saigata Plant specializes in manufacturing silicon single crystals using the FZ method. All of these manufacturing sites pay due consideration to regional atmospheric and river conditions in their daily production activities. They also promote exchange with local communities by energetically participating in environmental cleanup campaigns occasionally held by residents, companies and schools, and also have local representatives participate in disaster prevention drills.

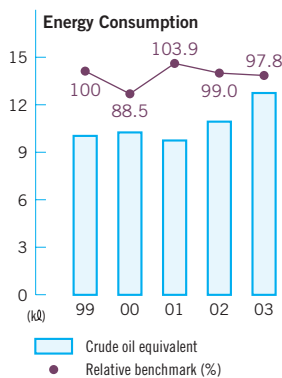
We aim to reduce environmental impact through ongoing efforts to improve production efficiency while reinforcing efforts to save energy and resources, manage waste and reduce environmentally harmful chemical substances.

In this environmental report, we provide data on key environmental factors at these four plants and, as an example, take a closer look at the Shirakawa Plant's activities.

## ENVIRONMENTAL MANAGEMENT BENCHMARKS

The production of silicon wafers requires highly purified silicon, energy, water, gas and chemicals. The main themes of environmental management at SEH are saving energy and resources and waste management. The key benchmarks used for environmental management are described below.

### Key Benchmarks



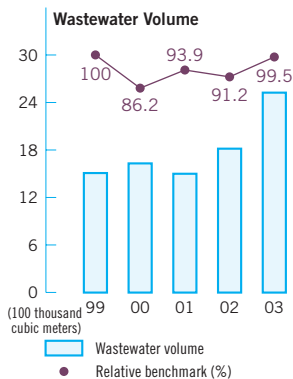
#### Energy Consumption

SEH uses electricity and heat as sources of energy in various manufacturing processes. To effectively use global resources, we take various measures to save energy.

Specifically, we engage in the following activities to increase energy efficiency through a variety of technological improvements:

- Installation of cogeneration systems
- Increasing efficiency of heating and cooling methods in processes
- Reducing power consumption by employing high-efficiency refrigerators
- Lowering energy costs by reusing waste heat

Energy consumption in fiscal 2003 was 127,000 kiloliters in crude oil equivalents, an energy saving of 1,500 kiloliters in crude oil equivalents per unit of sales from the previous fiscal year.



#### Wastewater

Our plants use two kinds of water. Process water, which is used to manufacture products and for washing, and cooling water, which is used for cooling manufacturing machinery. While reusing water after it has been used as much as possible, our plants release water into rivers after treatment and make sure that water quality meets or exceeds standards set by laws and regulations.

Over the past few years, the volume of wastewater has increased along with higher production volumes. Increasing the ratio of reused water is an issue to tackle going forward.

#### Wastewater Quality Monitoring Conditions: Shirakawa Plant

Wastewater quality analysis	Wastewater standard	'99	'00	'01	'02	'03
pH*	5.8-8.6	7.8	7.8	7.5	7.3	7.3
BOD* (mg/l)	<25.0	<2.9	<3.6	<2.9	<2.3	<4.8
SS* (mg/l)	<50.0	<4.8	<5.0	<4.1	<4.1	<3.6

#### \* Potential of Hydrogen (pH):

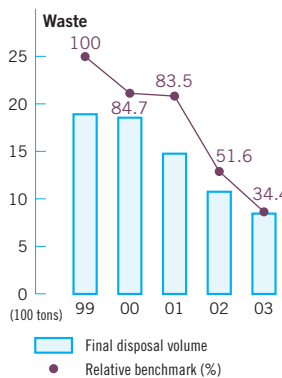
This is a unit of hydrogen ion exponent (log [H+]) that indicates whether a solution is acidic (less than pH 7), neutral (pH 7) or alkaline (more than pH 7).

#### \*Biochemical Oxygen Demand (BOD):

This indicates the amount of oxygen required for water-borne micro-organisms to break down contaminants in water. This value is a measure of the degree of water pollution.

#### \*Suspended Solids (SS):

These are organic and mineral particles that are suspended in water. They are a major cause of turbidity, and high concentrations have a significant impact on aquatic life.



#### Waste Management

We aim to recycle and reuse waste generated from manufacturing activities while keeping waste volume to a minimum. Our plants discharge industrial waste in the form of byproducts, used solvents, sludge, waste oil and waste acids. To reduce, reuse and recycle waste as an objective of our environmental management activities, we are advancing the recovery of valuable metals and the recycling of organic solvents, acids, alkali and inorganic sludge.

As a result, in fiscal 2003, total final disposal waste was slightly under 850 tons, a significant reduction of 35% in waste compared with fiscal 1999 levels.

## SAFETY AND OCCUPATIONAL HEALTH

### Safety Programs

SEH uses preventive safety committees to maintain safety and the environment within its facilities, and the HAZOP method and risk assessment methods constantly improve its facilities and operational processes. Our periodic safety patrol and safety suggestion programs have also made numerous contributions to this effort. As a result, our rate of worktime lost due to injury has been zero over the past five years.

### Occupational Health Programs

SEH provides employees with regular health checkups, and has made improvements to the working environment to prevent occupational illnesses. Mental health support is also available.

### Safety Achievement: Rate of Worktime Lost due to Injury

Fiscal years	'99	'00	'01	'02	'03
Number of injuries with lost days	0	0	0	0	0
Number of injuries with no days lost	4	4	2	2	3
Total cases	4	4	2	2	3
Rate of lost worktime	1.29	1.34	0.71	0.81	1.17

### Other Activities to Preserve the Environment and Ensure Safety

As a member of the Shin-Etsu Group, SEH is cooperating with Shin-Etsu Chemical in activities to preserve the environment and ensure safety. Every year, we conduct an environmental and safety audit of all our plants, and take numerous measures, including holding meetings of the preventive safety committee and promoting Zero Accident activities, in order to evaluate our environmental and safety measures from a variety of perspectives.

In addition, we periodically hold training drills to prepare for emergency situations. We are promoting the management of environmentally harmful chemical substances in accordance with regulations such as the RoHS Directive as well as taking safety measures during the transportation of chemicals.

## ENVIRONMENTAL MANAGEMENT AT SEH'S SHIRAKAWA PLANT

### Environmental Management at the Shirakawa Plant

The Shirakawa Plant is located on the border between Tochigi Prefecture and the southern tip of Fukushima Prefecture. The Shirakawa Plant is one of the world's largest featuring an integrated production line for single silicon crystals up to 300-mm wafers, and it will continue to meet the expectations of customers around the world as a production base for cutting-edge 300-mm wafers.



#### Outline of Shirakawa Plant

**Location:** Nishigo Villiage, Nishi-Shirakawa County, Fukushima Prefecture

**Start of operations:** December 1984

**Site area:** Approximately 450,000 square meters (52% of which is covered by vegetation)

**Main product:** Silicon wafers

#### Awards:

##### For the Environment

1992 Excellent Plant for Greenification, Minister of Trade and Industry Prize

1996 Commendation for Greenification Promotion Campaign, Prime Minister Award

1996 Beautiful Fukushima Environmental Award

##### For Occupational Health

1993 Fukushima Red Cross Blood Bank, Donation Commendation Prize

2002 Healthy Fukushima 21 Promotion Conference, Letter of Appreciation (Mayor of Fukushima Prefecture)

2002 Blood Donation Campaign National Conference, Letter of Appreciation, Minister of Labour, Health and Welfare Prize

**Mr. Tsubota, manager of the Safety & Environmental Control Department, talks about environmental management activities at the Shirakawa Plant.**



Rhododendrons at the Shirakawa plant

The Shirakawa Plant is surrounded by nature, and boasts a beautiful landscape of rhododendrons, the official flower of Fukushima Prefecture. The beauty of the natural environment surrounding the Shirakawa Plant is the result of campaigns to greenify the area, and it has been recognized with many awards including the Prime Minister Award for beautification of industrial parks. Our main environmental management activities extend from saving energy, exhaust gas and wastewater management to reducing and recycling waste.

In energy conservation, we installed our first cogeneration system in 1988 and now operate three systems at full capacity. The system effectively recovers and reuses excess thermal energy from compressors and other equipment.

In the environmental management of exhaust gases emitted from cogeneration systems, boilers and production lines, we take appropriate measures to treat exhaust gases on all production line processes before releasing them into the atmosphere. With regard to wastewater, we make concerted efforts to reduce wastewater volume and maintain water quality that clears wastewater standards.

We promote the 3Rs of reduce, reuse and recycle to lower industrial waste emissions. We are focusing in particular on the reuse of chemicals used in the manufacturing process and the reuse of wastewater sludge, aiming for a recycle rate of 98% or higher during fiscal 2004.

**In the manufacturing department, Mr. Ishizaki, Wafer Production Manager, and Mr. Hirano, Crystal Production Manager, talk about their daily activities to preserve the environment.**



Mr. Hirano, Crystal Production Manager

“In the crystal production department, we strive for continuous improvements while thoroughly pursuing saving energy by in-house designed equipment that efficiently manufactures cutting-edge products. In addition, we effectively use 100% of our silicon resources, the main material of our product, and promote recycling as part of our efforts to save resources. In secondary resources, we reuse 100% of our quartz crucible and carbon materials. To counter air pollution, we are deploying systems that do not emit oil mist by replacing the rotary oil pump method with the dry pump method.”



Mr. Ishizaki, Wafer Production Manager

“In the wafer production department, we are strongly aware of our responsibility as a supplier operating one of the world’s largest production bases for 300-mm silicon wafers. In our environmental management activities, we are installing highly efficient facilities that remove harmful gases from exhaust by designing and developing our own facilities in close cooperation with plant manufacturers. We have also installed highly reliable facilities that are easy to operate and manage. To save resources, we systematically separate used acids and alkalines with automated facilities to reuse them inside and outside the plant. To manage wastewater, we are focusing efforts on recycling wastewater generated in our manufacturing processes.”

**Mr. Onozawa, manager of the Facility Management Department, gives his thoughts on the facilities at the Shirakawa Plant.**



Wastewater treatment facilities

The facility management department is in charge of process management for all facility installations, engineering and managing plant facilities and equipment, and operating and managing utility facilities. In our environmental management activities, we have established an Accident Prevention Committee to ensure environmental protection and safety during plant construction. We concentrate on engineering plant facilities and equipment that improve energy saving, recycling, automation and reliability. In utility facilities, we carefully operate and manage high-voltage transformer stations, cogeneration systems, boilers, water purifiers and wastewater treatment facilities. In our daily management activities, we constantly strive to improve energy saving and recycling.

# HISTORY OF ENVIRONMENTAL ACTIVITIES

Shin-Etsu has engaged in quality control ever since 1950, quite an early period for such activities. In 1953, we established work manuals and standards and were awarded the Deming Prize. We received praise from Dr. Deming himself, who stated that in terms of the level of statistical quality control, we ranked “the highest in the world.”

In 1970, we established the Environmental Control & Safety Department. Since then, we have been actively engaged in environmental management. In 1996, our Gunma Complex obtained certification under ISO 14001, the first achievement of this kind for a major company in the Japanese chemical sector. Currently, each production base of our main subsidiaries and affiliated companies, such as Shin-Etsu Chemical and SEH, has obtained certification under ISO 14001, and we are working to ensure that all our plants, including those overseas, obtain such certification.

## History of Environmental Measures Taken by Shin-Etsu

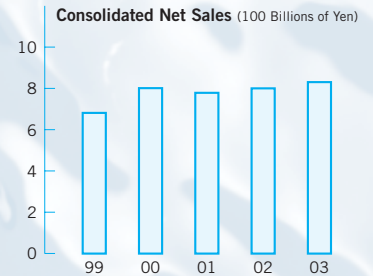
April	1953	Work manuals and standards formulated
November	1953	Third Deming Prize received
September	1955	Education and training committees established
March	1961	R&D Committee and Chemical Industry Council established
June	1961	Safety Council established
October	1961	First safety audit carried out
November	1966	Safety Health and Hygiene Committee established
November	1970	Environmental Control & Safety Department established
October	1971	Wastewater treatment facility completed at Isobe Plant
March	1972	Large-scale hydrochloric acid recovery facility (by-product incinerator) completed at Kashima Vinyl Monomer plant Fukui Environment Analysis Center established
November	1973	Companywide emergency council established
February	1974	Environmental Control & Safety Departments in each plant placed under direct jurisdiction of plant general managers
August	1975	Environmental Control & Safety Management Regulations and Emergency Response Regulations formulated
October	1989	CFC Control Countermeasures Committee established
May	1990	Global Environment Issues Countermeasures Committee established (by reorganizing the CFC Control Countermeasures Committee)
March	1995	Participation in Responsible Care (RC) promotion
July	1996	ISO 14001 certification obtained for the Gunma Complex
August	1998	Environmental Charter adopted
November	1998	First Environmental Report published
November	1999	Companywide hearing on environmental issues
March	2000	ISO 14001 certification obtained for all production plants in Japan
May	2000	Final disposal facility completed at the Gunma Complex
October	2001	Waste disposal facility completed at the Naoetsu Plant Kashima Plant wins Minister of Economy, Trade and Industry Award for Superior HP Gas Production Facility
July	2002	Naoetsu Plant wins Thirty-Year Special Achievement Award from the Japan Soda Industry Association
March	2003	Attended First International Conference on Green and Sustainable Chemistry (GSC TOKYO 2003)
July	2003	Kashima Plant receives Superior HP Gas Production Facility Award from Head of Kanto Bureau of Economy, Trade and Industry

## Domestic/International Developments

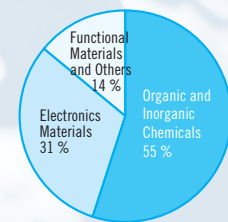
1948	Japan Chemical Industry Association founded
1951	Deming Prize established High-Pressure Gas Control Law was enacted
1967	Basic Law for Environmental Pollution Control enacted
1968	Air Pollution Control Law enacted
1970	Water Pollution Control Law enacted
1971	Law Concerning the Improvement of Pollution Prevention Systems in Specific Factories enacted
1972	Labor Safety and Sanitation Law enacted
1973	Law Concerning Examination and Regulation of Manufacture, etc. of Chemical Substances enacted
1975	Petroleum Kombinat, etc. Disaster Prevention Law enacted
1988	Montreal Protocol promulgated
1992	UN Conference on Environment and Development (Earth Summit in Rio de Janeiro) held
1993	Basic Environment Law enacted Rationalization of Energy Consumption Law enacted
1994	United Nations Framework Convention on Climate Change took effect
1995	Law for Promotion of Sorted Collection and Recycling of Containers and Packaging enacted
1996	International standard for environmental management systems, ISO 14001, took effect
1997	Waste Management and Public Cleaning Law revised
1998	Law Concerning the Promotion of the Measures to Cope with Global Warming enacted
1999	Law Concerning Reporting, etc. of Release to the Environment of Specific Chemical Substances and Promoting Improvements in Their Management enacted
2001	Law Concerning Special Measures against Dioxins enacted
2001	Basic Law for Establishing the Recycling- based Society took effect
2002	Provisions of the Soil Pollution Control Law enacted World Summit on Sustainable Development (Earth Summit in Johannesburg) held
2003	Revised Law Concerning Examination and Regulation of Manufacture, etc. of Chemical Substances promulgated Waste Management and Public Cleansing Law fully enforced

## Corporate Profile

Date of Establishment	September 16, 1926
Capital	¥110,493 million (US\$1,042 million)
Consolidated Net Sales	¥832,805 million (US\$7,857 million)
Consolidated Net Income	¥74,806 million (US\$706 million)
Number of Employees	2,571 (17,384 on a consolidated basis)
Head Office	6-1, Otemachi 2-chome, Chiyoda-ku, Tokyo 100-0004 ,Japan Phone: +81-3-3246-5091 Fax: +81-3-3246-5096
URL	http://www.shinetsu.co.jp
Information	Public Relations Department 6-1, Ohtemachi 2- chome, Chiyoda-ku, Tokyo 100-0004, Japan Phone: +81-3-3246-5091 Fax: +81-3-3246-5096
E-mail address	sec-pr@shinetsu.jp



**Net Sales by Segment**  
(Consolidated)



## ISO 14001 Certification of the Shin-Etsu Group

\*Shin-Etsu chemical was the first major chemical producer in Japan to acquire ISO 14001 certification.

Company	Certification Date	Certification Number	Certifying Agency
<b>Shin-Etsu Chemical</b>			
Gunma	7/1/1996	JCQA-E-002	JCQA
Takefu	12/25/1998	JQA-EM0298	JQA
Naoetsu	5/31/1999	JCQA-E-0064	JCQA
Kashima	3/21/2000	JCQA-E-0126	JCQA
<b>Shin-Etsu Handotai Group</b>			
Shirakawa	1/21/1997	E9073	SGS UK LTD
Takefu	7/24/1997	TW97/10362EM	SGS UK LTD
Isobe	11/10/1997	TW97/11339EM	SGS UK LTD
Saigata	12/16/1997	TW97/11540EM	SGS UK LTD
Nagano Electronics Industrial	2/20/1998	TW98/12319EM	SGS UK LTD
Naoetsu Electronics Industrial	7/28/1998	TW98/13930EM	SGS UK LTD
S.E.H. Malaysia	5/8/1998	S027001058	SIRIM
S.E.H. America	9/25/1998	33486	ABS
S.O.E. (Taiwan)	11/18/1998	90 104 8198	TUV
S.E.H. Europe	1/26/1999	E00053	NQA
S.E.H. Taiwan	8/24/1999	T992009	LLOYD'S
S.E.H. Shah Alam	9/21/1999	S034301099	SIRIM
Nisshin Chemical Industry	4/24/2000	JCQA-E-0137	JCQA
<b>Shin-Etsu Quartz Products</b>			
Takefu	1/5/2000	35154	ABS-QE
Koriyama	6/14/2000	35155	ABS-QE
Sasebo	10/21/2002	36806	ABS-QE
Kyushu	10/3/2003	37949	ABS-QE
Fukui	6/20/2002	36800	ABS-QE
Yamagata	11/2/2001	36558	ABS-QE
Naoetsu Precision	10/23/2000	JCQA-E-0187	JCQA
JAPAN VAM & POVAL CO., LTD. (formerly Shin-Etsu Vinyl Acetate)	1/11/1999	JCQA-E-0042	JCQA
Shin-Etsu PVC	6/1/1996	87818	BVQI
CIRES	11/20/2002	02/AMB.070	APCER
SE Tylose GmbH & Co. KG	10/22/1997	01 104 7041	TUVCERT
Shin-Etsu Silicone Taiwan Co., LTD.	6/6/2000	E18050	SGS-Yarsley

**ShinEtsu**  
Shin-Etsu Chemical Co., Ltd.

