



Sumitomo Bakelite

Environmental
Report

Environmental Report 2003

(April 2002–March 2003)



Tsuneo Moriya,
President

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A Message from the President



The Johannesburg Summit was held in 2002, one decade after the Earth Summit in Rio de Janeiro, Brazil. In his address to the summit, United Nations Secretary General Kofi Atta Annan said that commercial enterprises have a vital role to play in achieving harmony between the environment and development. Accordingly, individual companies' voluntary efforts to achieve a recycling-based society have become increasingly crucial.

In January 2003, the resolution was made in Europe to adopt the Restriction of Hazardous Substances in Electrical and Electronic Equipment (RoHS) and Waste from Electrical and Electronic Equipment (WEEE) directives, and the Directive on End-of-life Vehicles (ELVs) was enforced in July 2003, thus prohibiting the use of cadmium, lead, mercury, hexavalent chromium, and specified bromine compounds. In Japan, the Soil Contamination Countermeasures Law went into effect in February 2003; Pollutant Release and Transfer Register (PRTR) Law-based disclosure of release and transfer amounts of chemical substances specified by government ordinance took place in March; and, in July, the Building Standard Law was revised as a means to counter the "sick house" phenomenon.

The anti-global warming measures and adjustments to legislative systems to formulate a recycling-based society that took place in fiscal 2001 have been followed up by worldwide efforts to ensure the safety of chemical substances.

The Sumitomo Bakelite Group has continued to implement "Society and environment-compatible management" as a crucial policy for its business activities and has implemented Responsible Care measures and participated in the Japan Responsible Care Council since its establishment in 1995. Responsible Care is a voluntary program for implementing and improving measures and it is mindful of environmental protection and the health and safety of our stakeholders over a product's entire life cycle, from development through production, distribution, use, final consumption, and disposal. We also proactively participate in university programs, enlightenment activities at exhibitions, and other such projects.

Topics covered in this report include the following:

- Compliance to both Japanese and overseas environmental regulations on the worldwide business activities of the parent company and 41 group companies. Regarding ISO 14001, the international environmental management systems standard, 15 firms and 18 production plants (58% of the Sumitomo Bakelite Group's 26 firms and 31 plants) have attained certification.
- The results of our medium- and long-term targets, including zero waste emissions, aimed at the reduction of environmental impact. Included herein is the in-house certification of Yamaroku Kasei Industry Co., Ltd.—a Group member—as a zero waste emissions facility.
- Our efforts to promote the sale of environmentally friendly products are gradually achieving results. An environmental perspective factors prominently in our new production development activities, and our current objective is to achieve a 20% ratio of environmentally friendly products in total net sales, and we have been developing new products. In fiscal 2002, ended March 31, 2003, we raised this ratio to 8.4%.
- The activities undertaken for fulfilling the social responsibilities and environmental impact data of six overseas subsidiaries.

We consider this environmental report to be a valuable tool for communicating with our stakeholders and for relaying the environmental conservation efforts of the Sumitomo Bakelite Group. To this end, we would be very grateful if you convey to us your suggestions, advice, or additional information that you consider would be useful for further improving this report.

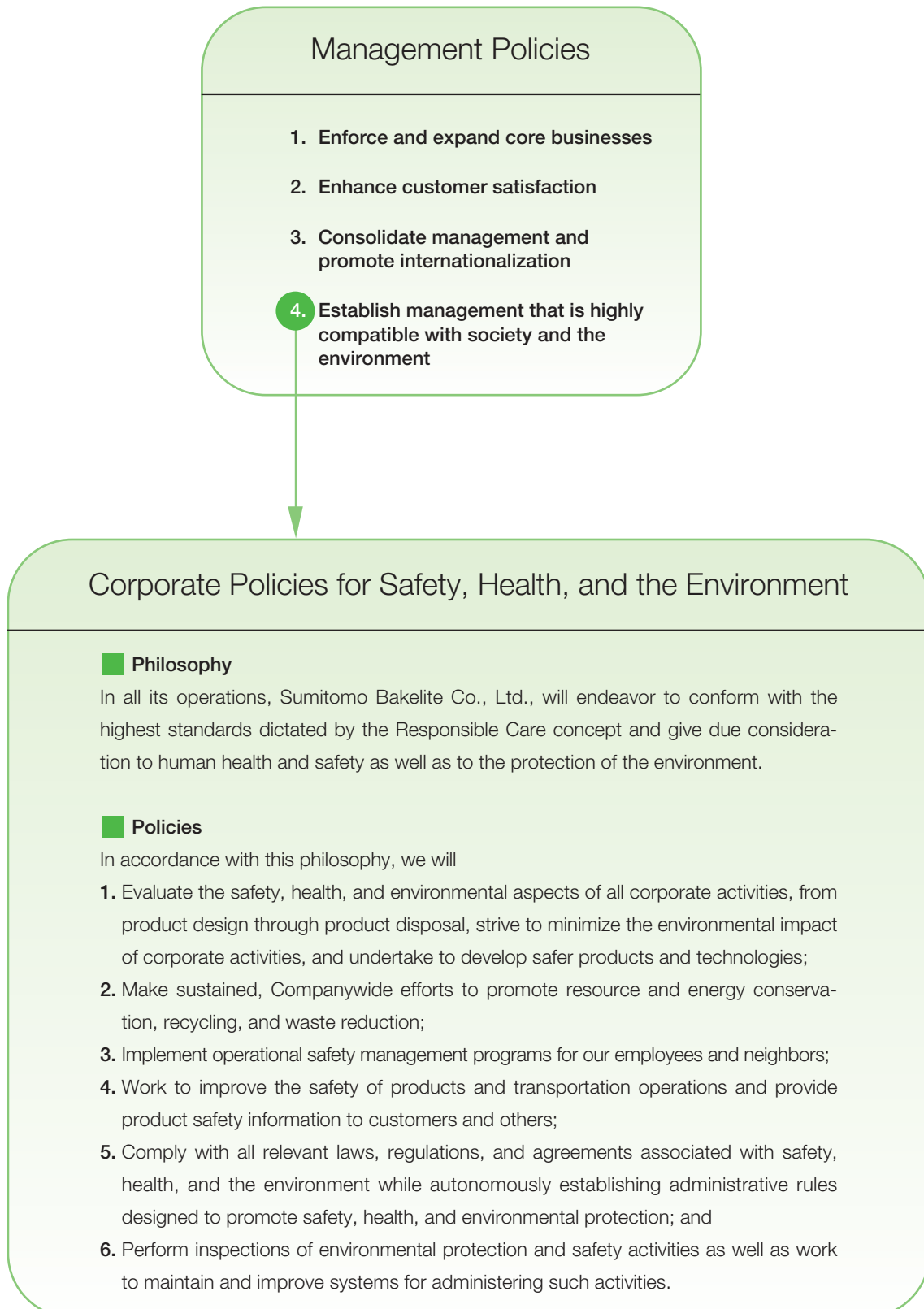
August 2003

Tsuneo Moriya
President

Tsuneo Moriya



- The Sumitomo Bakelite Group has set environmental targets based on environmental and safety management policies in line with its basic policy of “Society and environment-compatible management.”



Environmental Targets

Under Sumitomo Bakelite's environmental and safety management policies, the Company set medium- and long-term targets using fiscal 1999 as the standard for comparison and moved forward with Groupwide efforts starting in fiscal 2000.

Medium- and Long-term Environmental Impact Reduction Targets

- ① Amount of waste generated 60% reduction (Target date: 2005)
- ② Zero waste emissions Complete elimination (Target date: 2005)
- ③ Emissions of solvents and others 99% reduction (Target date: 2005)
- ④ CO₂ emissions 6% reduction (Target date: 2010)

Environmental target areas include ① amount of waste generated; ② zero waste emissions (complete elimination of wastes landfilled and external incinerated); ③ emissions of solvents and others; and ④ carbon dioxide (CO₂) emissions.

Environmental Impact Reduction Results and Targets

Action	Unit	1999 (base year) Results	2001 Results	2002 Results	2003 Targets	2005 Targets
① Amount of waste generated	Tons/year	10,906	8,884	8,471	40% reduction (6,600)	60% reduction vs. 1999 (base year) results 10,906
② Zero waste emissions	Tons/year	3,923	3,127	2,413	70% reduction (1,200)	100% reduction vs. 1999 (base year) results 3,923
③ Emissions of solvents and others	Tons/year	3,163	2,796	1,398	80% reduction (640)	99% reduction vs. 1999 (base year) results 3,163
④ CO ₂ emissions	Tons/year	130,769	116,187	127,169	2.5% reduction (127,500)	3.5% reduction vs. 1999 (base year) results 130,769

Calculated based on emissions from four plants and one affiliate

Calculated based on emissions from four plants + two laboratories + six affiliates

Until fiscal 2001, with respect to environmental impact reduction, action plans, including reduction measures and their respective timetables, were implemented at five establishments: the Amagasaki, Shizuoka, Utsunomiya, and Tsu plants as well as Akita Sumitomo Bakelite Co., Ltd. Emission amounts for the fiscal years 1999 through 2001 are derived from the total emissions of these five establishments.

After expanding the scope of these calculations, the total emission amounts have been calculated from four plants, two laboratories, and six affiliated companies since fiscal 2002.

However, the scope of reduction targets for ① amount of waste generated, ② zero waste emissions (complete elimination of waste landfilled and external incinerated), and ③ emissions of solvents and others has not been changed. As for ④ CO₂ emissions, the expanded scope has been adopted.

Summary of Environmental Impact Reduction Activities



- The Sumitomo Bakelite Group undertakes its environmental activities by setting specific targets for the reduction of environmental impact.

Item	Fiscal 2002 targets
Amount of waste generated	Reduce total waste amount, including wastes landfilled and external incinerated, internal incinerated, and external recycled (expenses paid) to 7,500 tons or less
Zero waste emissions	Reduce total amount, including wastes landfilled and external incinerated, to 2,100 tons or less
Emissions of solvents and others	Reduce emissions to the atmosphere of solvents and other chemicals designated by the PRTR Law of the Japan Chemical Industry Association (JCIA) to 1,300 tons or less
CO₂ emissions	Reduce CO ₂ emissions that result from energy consumption (fuel and electricity) in production operations to 125,000 tons or less



From fiscal 2002, two laboratories and five affiliates have been newly included in these efforts, with progress monitored on a monthly basis.

Targets and corresponding results for fiscal 2002 are indicated in the table below. None of the four targets were achieved. However, during the second half of fiscal 2002, the reduction of waste generated and zero waste emissions (waste landfilled and external incinerated) were achieved as planned. Furthermore, in comparison with the previous fiscal year, zero waste emissions substances were reduced by approximately 40% through recycling and emissions of solvents and others were reduced by approximately 50% through the installation and operation of exhaust gas processing.

	Fiscal 2002 results	Target comparison	Self evaluation	Related pages
	Amount of waste generated totaled 8,471 tons, approximately 1,000 tons more than the target	13% over	D	p.17
	Amount of zero waste emissions substances totaled 2,413 tons, approximately 300 tons more than the target	15% over	D	p.17
	Emissions totaled 1,398 tons, approximately 100 tons more than the target	8% over	C	p.14
	CO ₂ emissions totaled 127,169, approximately on target	2% over	B	p.15

A: Below target
 B: 0% to 5% over target
 C: 5% to 10% over target
 D: More than 10% over target

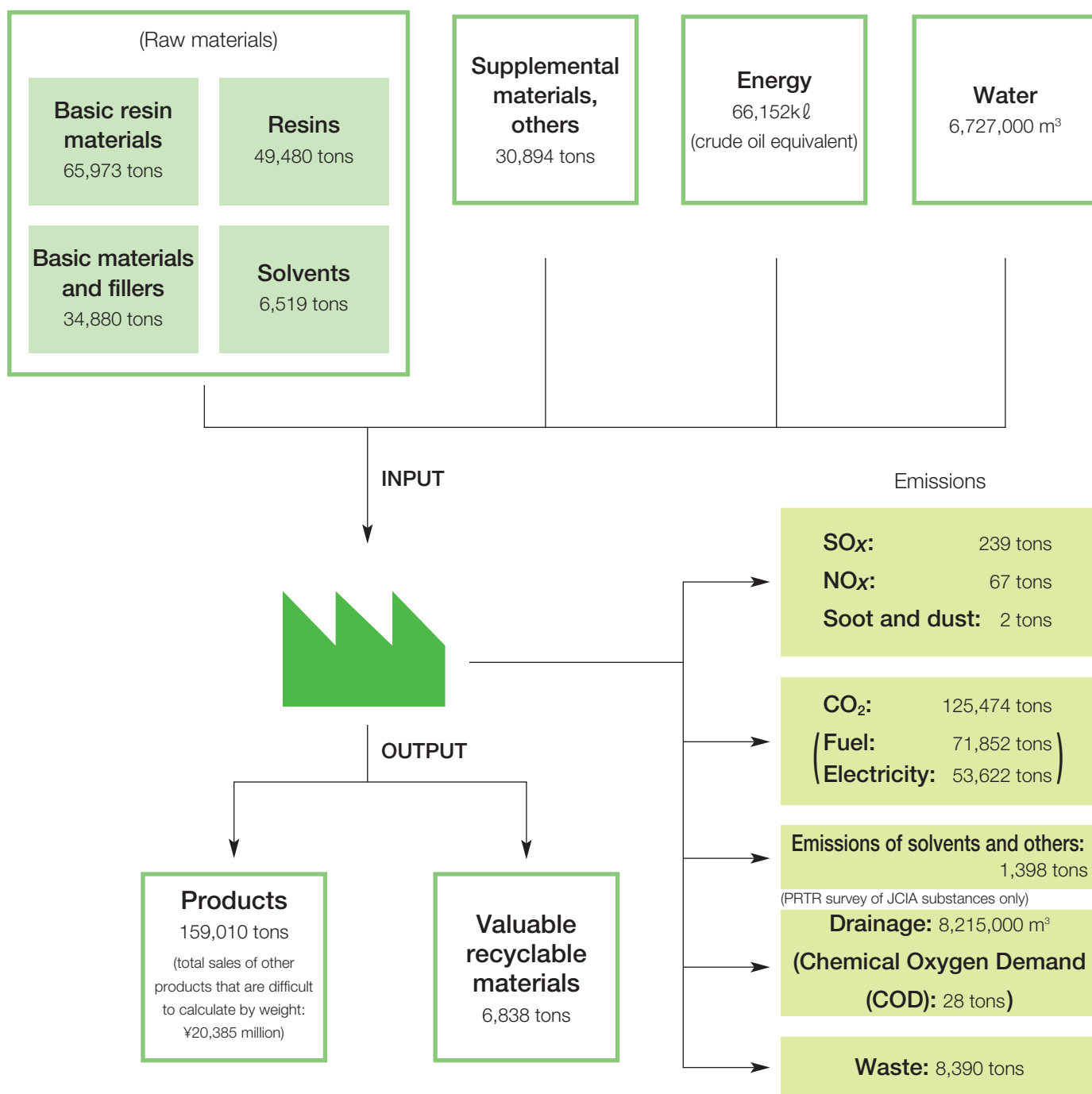


Environmental Impact and Material Balance



■ The chart below illustrates the flow of materials at Sumitomo Bakelite in terms of the environment.

The chart indicates such input as raw materials and energy and such output as products and substances that are emitted into the environment. To reduce environmental impact, Sumitomo Bakelite strives to decrease emissions as well as conserve resources by curtailing consumption of such input as raw materials, energy, and water.

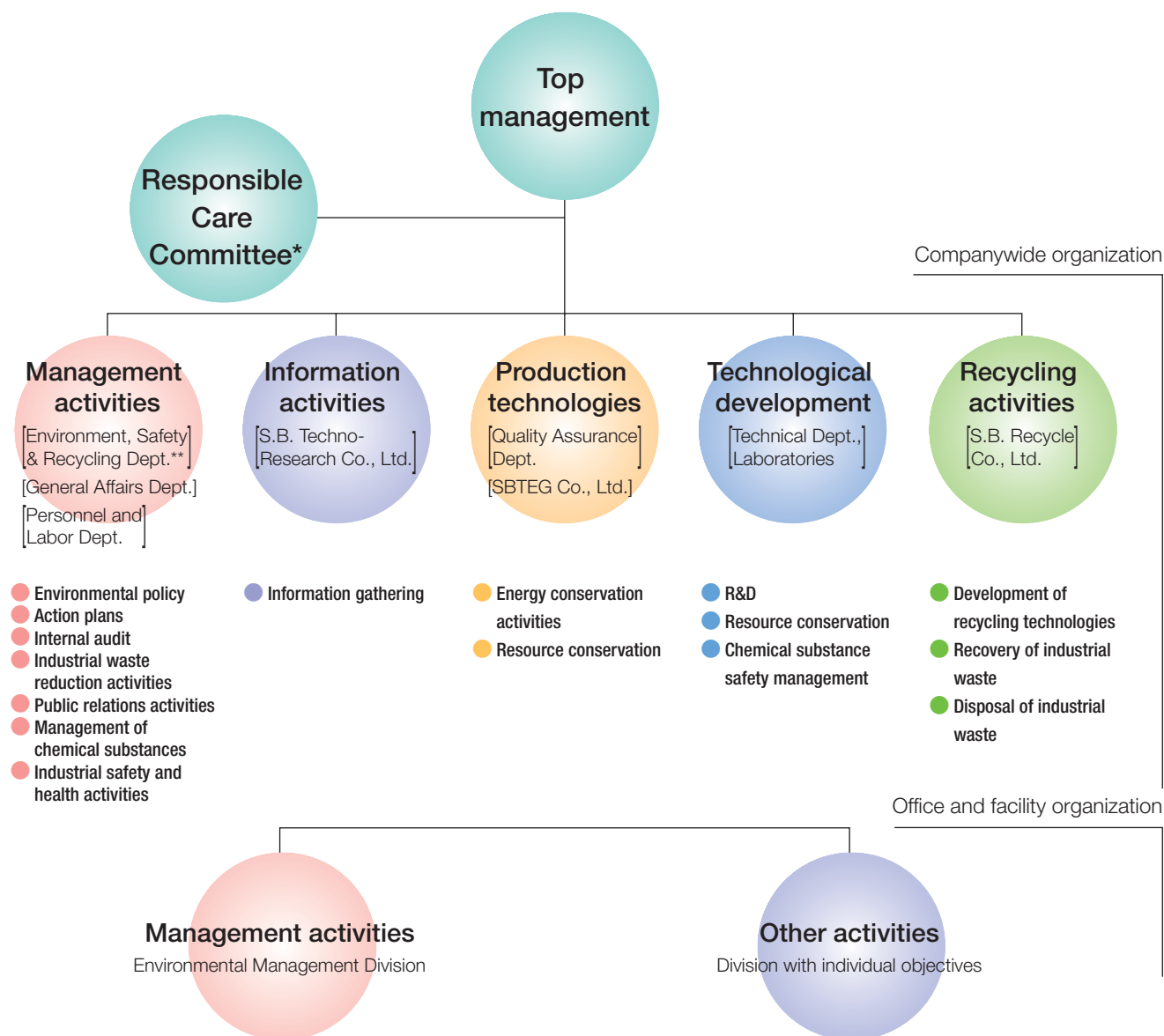


Scope of this survey: The Amagasaki (including affiliated companies on the same property), Shizuoka (including affiliated companies on the same property), Utsunomiya, and Tsu plants of Sumitomo Bakelite Co., Ltd., as well as Akita Sumitomo Bakelite Co., Ltd., Arlite Kogyo Co., Ltd., Tokyo Kakohin Co., Ltd., Hokkai Taiyo Plastic Co., Ltd., Yamaroku Kasei Industry Co., Ltd., and Kyushu Bakelite Industry Co., Ltd.



Sumitomo Bakelite's organization for environmental conservation and the assurance of safety and health

Sumitomo Bakelite follows the policy of Responsible Care for the safeguarding of the environment, safety, and health throughout the full life cycle of chemical substances, from their development through their disposal. The Company has organized a Responsible Care Committee, staffed by members of top management. Implementation of Responsible Care is handled by a Companywide organization that is centered around the head office and similar organizations at each office and facility that act through environmental management divisions as well as other divisions with individual objectives.



Notes: * The Responsible Care Committee works out plans and projects for Companywide Responsible Care activities and holds the authority to grant approval to individual office and facility activities.

** The Environmental Protection and Recycling Initiatives Division acts as the secretariat for Responsible Care activities and also handles the coordination of individual office and facility activities.

- Administration and assistance for environmental maintenance and improvement and safety assurance at offices and facilities
- Internal auditing of environment- and safety-related Responsible Care efforts at offices and facilities. (Audits are conducted annually for domestic offices and facilities and once every three years for those overseas.)
- Support for attainment of ISO 14001 certification
- Handling of surveys and applications related to safety management and legal regulations related to chemical substances
- Feasibility studies and planning of internal and external recycling activities



■ Sumitomo Bakelite adopted environmental accounting in fiscal 2000.

In fiscal 2000, Sumitomo Bakelite introduced environmental accounting as an effective tool to implement business activities in line with the environment. Environmental accounting quantifies the cost and effect in association with environmental conservation activities. It is an excellent tool to promote environmentally conscious business activities more efficiently and to enhance the understanding of our efforts through the disclosure of information to our stakeholders.

With reference to *Environmental Accounting Guidelines 2000, 2002* released by the Ministry of the Environment, we established a framework for quantitatively measuring progress in our activities to help reduce the environmental burden. Under the framework, we continuously make efforts to evaluate the environmental conservation activities based on our own compilation methods and enhance the effectiveness of our compilation methods through ongoing reviews and reassessments.

In fiscal 2000, we introduced environmental accounting to our five plants and two laboratories and subsequently expanded its scope to all of our domestic business establishments including affiliated companies (listed below).

Environmental conservation costs for fiscal 2002

Item	Investment (Millions of yen)	Expenses (Millions of yen)	Description
(A) Reduction of emissions into the environment	¥123	¥ 163	<ul style="list-style-type: none"> • Installation of exhaust gas processing • Renovation of deodorizing equipment
(B) Energy conservation	58	13	<ul style="list-style-type: none"> • Renovation of air conditioners • Replacement of energy-saving transformers
(C) Reduction of industrial waste, promotion of recycling and waste treatment	25	571	<ul style="list-style-type: none"> • Installation of sludge reduction equipment • Waste treatment
(D) Product evaluation at R&D stage	1	271	<ul style="list-style-type: none"> • R&D for environmentally friendly products
(E) Reduction of environmental burden upstream and downstream	—	34	<ul style="list-style-type: none"> • Consignment fee to the Japan Containers and Packaging Recycling Association
(F) Environmental management activities	1	225	<ul style="list-style-type: none"> • Personnel costs for environmental management activities • Greening activities and maintenance of green space
(G) Contributions to social activities	—	19	<ul style="list-style-type: none"> • Activities for external communications
(H) Response to environmental damage	—	—	
Total	¥208	¥1,296	

Period: April 2002 to March 2003

Scope of Compilation: Sumitomo Bakelite Co., Ltd.

Amagasaki Plant, including subsidiaries and affiliated companies on the premises; Shizuoka Plant, including subsidiaries and affiliated companies on the premises; Utsunomiya and Tsu plants; Fundamental Research Laboratory and Kobe Fundamental Research Laboratory of Sumitomo Bakelite Co., Ltd.; Akita Sumitomo Bakelite Co., Ltd.; Arlite Kogyo Co., Ltd.; Tokyo Kakohin Co., Ltd.; Hokkai Taiyo Plastic Co., Ltd.; Yamaroku Kasei Industry Co., Ltd.; Kyushu Bakelite Industry Co., Ltd.

(Sano Plastic was liquidated and part of its operations was transferred to Tokyo Kakohin Co., Ltd.)

■ Compilation Method

- Compilations were based on the Company's Environmental Accounting Compilation Guidelines with reference to *Environmental Accounting Guidelines 2000, 2002* released by the Ministry of the Environment.
- Regarding costs not used for environmental conservation purposes and other complex costs included in investments, as of fiscal 2002, environmental conservation costs were compiled through proportional division of the portion of environmental conservation-related costs.
- Among various effects, only economic effects with substantial conclusive evidence were recorded.
- Expenses do not include depreciation costs.
- With regard to R&D, investment outlays and expenses were compiled along environment-related categories.

Effects of Environmental Conservation for Fiscal 2002

Reduction in Environmental Burden (Compared with previous fiscal year)*		Environmental Burden (Fiscal 2002)	
Reduction in atmospheric emissions of solvents and others	1,404 tons	Atmospheric emissions of solvents and others	1,398 tons
Reduction in CO ₂ emissions	-10,982 tons*	CO ₂ emissions	127,169 tons
Reduction in industrial waste generated	1,945 tons	Industrial waste generated	8,471 tons
Reduction in landfill and external incineration of waste	1,633 tons	Landfill and external incineration of waste	2,413 tons

* CO₂ emissions decreased compared with the previous fiscal year's through the installation of exhaust gas processing, which reduces atmospheric emissions of solvents and others.

Economic Effects for Fiscal 2002

Item	Amount (Millions of yen)
(1) Reduction in costs due to energy conservation	¥ 32
(2) Reduction in costs by waste reduction	16
(3) Income from recycling	45
(4) Reduction in costs by internal recycling	247
(5) Reduction in costs by circulation of factory drain water	23
Total	¥363

- Total sales of environment-friendly products were ¥8,012 million (¥1,635 million increase in comparison with fiscal 2001), accounting for approximately 8.4% of total net sales (1.8% increase in comparison with fiscal 2001).

Products That Provide Environmental Solutions



■ **The Sumitomo Bakelite Group strives to develop products that safeguard the environment, safety, and health at all stages, from development through disposal.**

As one of the world's leading manufacturers, Sumitomo Bakelite strives to develop and sell products that contain no hazardous or harmful substances in their manufacture, that do not require our customers to use such substances, and that are easily recyclable and whose constituent materials are easily recoverable.

■ Epoxy molding compound SUMIKON® EME

With SUMIKON® EME, Sumitomo Bakelite has developed an epoxy resin forming material for semiconductor sealing that uses no bromine- or antimony-based flame retardants with substantial impact on the environment and is compatible with lead-free solder mounting.

Sumitomo Bakelite offers the SUMIKON® EME-G700 series for high-reliability applications as well as the newly developed SUMIKON® EME-G600 series for general-purpose packaging.

Leveraging our environmental impact reducing material design technologies, we strive to decrease the burden on the environment by offering a green product range that covers leading-edge semiconductor packaging through general-purpose packaging.



■ SUMIRESIN EXCEL® CRM semiconductor die attach paste

Sumitomo Bakelite has developed and now markets the SUMIRESIN EXCEL® CRM-1076 Series high-reliability die attach paste, which is compatible with the increased mounting temperatures associated with lead-free solder, as well as the CRM-1500 series for area mounting and the new CRM-1300 series, which contains no mutagens and is thus very environment-friendly.



■ Wafer coating material SUMIRESIN EXCEL® CRC

Due to the rapid increase in semiconductor memory capacity and demand for high-speed compatibility, circuit widths have narrowed and demands for reliability have become more and more exacting.

To meet these demands, Sumitomo Bakelite has developed the CRC-8000 series of positive-type photosensitive wafer coating resins. This new series enables the use of alkaline aqueous solution as developing fluid and pure water as rinse fluid. It also eliminates the need for semiconductor manufacturers' use of special solutions. Furthermore, a new use for the series has been developed as an alternative to traditional plastic sealing of certain wafer-level packages, thus enabling energy conservation by reducing semiconductor manufacturing processes.



■ SUMILITE® PLC, ELC, and APL (GS series) "green" laminates

Sumitomo Bakelite has developed and now markets its GS series of halogen- and antimony-free environment-friendly laminates for use as electric circuit boards. The series consists of a full range of grades, from paper phenol material for single-sided boards and low-rate expansion materials for package substrates. We have also newly developed rolled copper-clad laminates using the high-energy conserving roll press method.



■ SUMILITE® TFP flexible printed circuit boards

Sumitomo Bakelite has developed and currently sells environment-friendly halogen- and antimony-free flexible printed circuit boards and an epoxy adhesive for use in flexible copper laminates and cover lays, as well as environment-friendly printed circuit boards that use lead-free solder plating on connector terminals and surface mounting. Furthermore, in addition to our traditional single- and dual-sided flexible printed circuit boards, we have also developed and now market halogen- and lead-free environment-friendly multilayer flexible printed circuit boards.



SUMIZAC® SZF solder-replacing curing films

Sumitomo Bakelite's SUMIZAC® SZF is a lineup of curable anisotropic conductive films that provide an alternative to solder for circuit electrode connection. Since these films enable one-stop connection of minute circuits, they have become indispensable materials for connecting glass panels with circuit boards in flat panel displays, which are rapidly growing in size and clarity of definition. They also eliminate the need for solder reflow and enable shorter work time and lower temperatures in the connection of ICs and electronic components to circuit boards. We are also working to develop acrylic resin-based non-mutagenic materials.



SUMILITERESIN® ECP epoxy coating powder for electronic components

High-speed laser marking has replaced traditional ink sealing as the primary method of marking electronic components. Although lead compounds have been widely used as laser color fixing agents, Sumitomo Bakelite has developed and now sells lead-free epoxy coating powder using copper and nickel compounds. All lead compounds were eliminated from our coating powder products in fiscal 2001. We also provide halogen- and antimony-free epoxy coating powder.



SUMIMAC® ECR liquid epoxy resin for use in electric and electronic components

Sumitomo Bakelite has developed and now markets liquid epoxy resin for SMD components, which are compatible with lead-free solder mounting. We also provide environment-friendly halogen- and antimony-free products.

Furthermore, to enhance the connective reliability of BGAs and printed circuit boards (mother boards), we have newly developed low-temperature quick-curing secondary mounting underfill material that contributes to energy conservation during the machining process and is stable even in cold storage.



SUMILITERESIN® PR phenolic resins

Leveraging its independently developed reaction technology, Sumitomo Bakelite has brought to the market environmentally sound phenolic resins that are friendly to both the global environment and the work environment and fulfill the requirements of the PRTR Law, the Industrial Safety and Health Law, and the Poisonous and Deleterious Substances Control Law. Products in the lineup include resins with extremely low levels of unreacted monomers and dimer content, completely aqueous low-monomer types that contain no organic solvents, and dust-free powder resins with extremely low-level emission of dust particles.



SUMIKON® PM sprue-free and runner-free phenolic resin molding compounds

Phenolic resin molding compounds usually produce such waste by-products as sprue and runner during the molding process. Sumitomo Bakelite has already perfected a material recycling system that reuses such material—including molded products collected from its customers—as molding material as well as raw material and fuel for cement. Going one step further, we have now developed a technology for substantially reducing the amount of such waste material itself. By combining our die, molding, and materials technologies, we offer comprehensive sprue-free and runner-free forming technologies. We are also currently developing a material that produces no burr, which is another by-product of the molding process. We have also developed and now market phenol resin-forming materials that are metallic alternatives. They have enabled the production of lighter-weight brake pistons, pulleys, and other automobile components, thereby contributing to improved fuel efficiency.

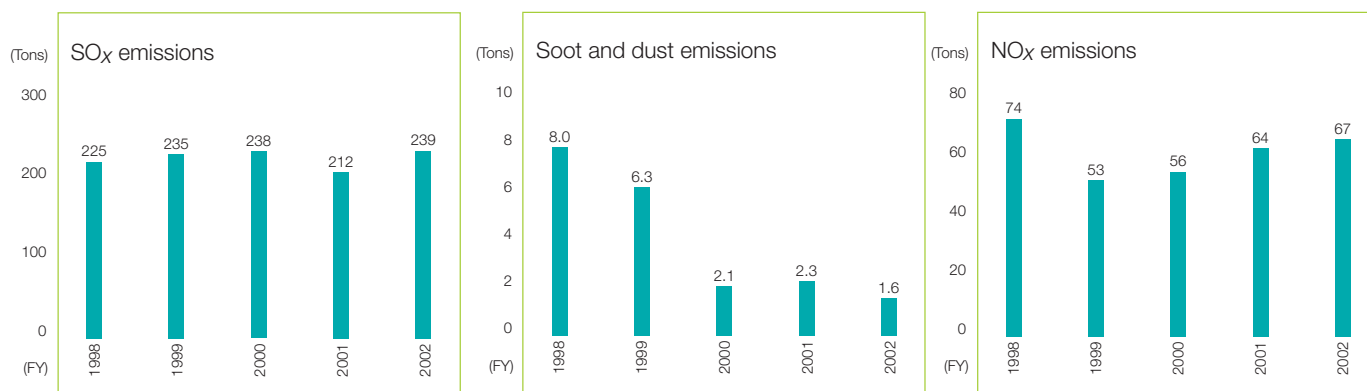




Sumitomo Bakelite strives to reduce substances that are emitted into both the air and water that impact the environment.

Air

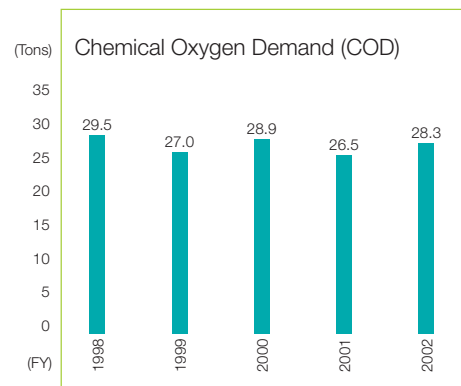
Sumitomo Bakelite observes domestic emissions standards as well as standards based on agreements with local communities on SO_x emissions and other soot particles emitted by boilers and other installations. In addition, in fiscal 2002, the Company took further steps to reduce its emission of SO_x, NO_x, and soot by installing a natural gas fueled cogeneration system.



Water

Discharged water from manufacturing plants consists primarily of wastewater from operational processes and human use and rainwater (including cooling water). Sumitomo Bakelite strives to conserve water resources and reduce water-release by recirculating cooling water.

As for wastewater, we operate treatment installations, including high-precision phenol collection units, activated sludge process equipment, and neutralizing agglutinate precipitation units (metal disposition) and, with surveillance equipment, have established an ongoing monitoring system in compliance with domestic wastewater standards and local agreements on pollution prevention.



Activated sludge process equipment (Shizuoka Plant)



Water recirculation equipment (Amagasaki Plant)

Note: COD: When the oxidizing agent potassium permanganate oxidizes organic matter in water, it alters the amount of consumable oxygen volume, which is used as an indicator of organic matter pollution in water.

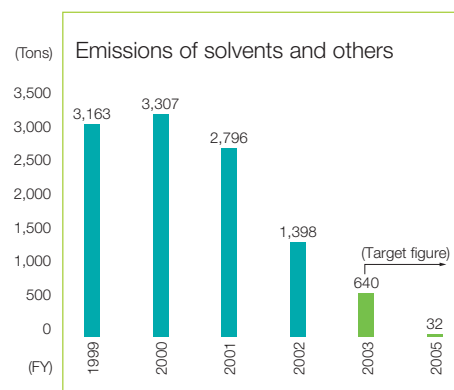
Reduction of emissions of solvents and others

As a member of the JCIA, Sumitomo Bakelite has been registering its pollutants released and transferred since 1996, five years before the enforcement of the PRTR Law in 2001, and striving to ascertain the amount of emissions and transfers and, in particular, to reduce the emissions into the atmosphere as one of its medium- and long-term targets. The accompanying graph illustrates emissions of solvents and other chemicals that correspond to the scope of JCIA PRTR surveys from fiscal 1999 onward. Through the systematic installation of exhaust gas processing units, in fiscal 2002, we achieved an approximately 50% (1,398 tons) year-on-year reduction in emissions. However, emissions still exceeded our medium- and long-term objective by approximately 100 tons. We will continue to set new reduction targets and manage them accordingly.

Our emissions and transfers of the 30 substances subject to the PRTR Law* are listed in the table below.



Waste gas processing facilities



Scope of statistics gathering: Fiscal 1999 to 2001: the five sites listed on page 4. Fiscal 2002 onward: all 12 domestic sites listed on page 33.

Emission and transfer volumes of substances subject to the PRTR Law* (Fiscal 2002 actual results)

(Tons/year; volumes for dioxins are mg-TEQ**/year)

Government order no.	Substance	Amount used (manufactured)	Amount released					Amount transferred	
			Into air	Into water	Into soil	As waste matter	Into sewers		
1	Zinc compounds (water-soluble)	54	0	0	0	0.9	0		
15	Aniline	126	0	0	0	0	0		
25	Antimony and its compounds	166	0	0	0	10	0		
29	Bisphenol A	325	0	0	0	0	0		
30	Bisphenol A-type epoxy resin (liquid)	1,493	0	0	0	0	0		
42	Ethylene oxide	3	2.6	0	0	0	0		
43	Ethylene glycol	809	0	0	0	1.8	0		
44	Ethylene glycol monoethyl ether	21	0	0	0	0	0		
45	Ethylene glycol monomethyl ether	412	319	0	0	8.6	0		
63	Xylene	58	20	0	0	0.3	0		
64	Silver and its water-soluble compounds	8	0	0	0	0	0		
67	Cresol	1,014	0	0	0	0	0		
172	N,N-dimethyl formamide	478	10	0	0	1.3	0		
176	Organic tin compounds	22	0	0	0	1.5	0		
177	Styrene	12	0.7	0	0	0	0		
198	Hexamethylenetetramine	1,336	0	0	0	18	0		
202	Tetrahydromethylphthalic anhydride	85	0	0	0	0	0		
207	Copper salts (waste-soluble, except complex salts)	(100)	0	0.4	0	9.0	0		
227	Toluene	596	94	0	0	7.6	0		
232	Nickel compounds	1	0	0	0	0	0		
242	Nonylphenol	7	0	0	0	0	0		
243	Barium and its water-soluble compounds	54	0	0	0	0	0		
266	Phenol	24,794	2.3	0	0	16	0		
270	Di-n-butyl phthalate	9	0	0	0	0	0		
272	Bis (2-ethylhexyl) phthalate	32	0	0	0	2.4	0		
299	Benzene	(4)	0.1	0	0	3.6	0		
300	1,2,4-benzenetricarboxylic 1,2-anhydride	13	0	0	0	1.1	0		
304	Boron and its compounds	26	0	0	0	0.4	0		
310	Formaldehyde	10,861	0.7	0.1	0	6.1	0		
		(14,810)	0	0	0	0	0		
179	Dioxins***	—	1.8	0	0	0	0		

Class I Designated chemical substances.

Notes: * Based on the PRTR Law, by ascertaining their emissions of various harmful chemical substances, companies handling these substances are urged to improve their own independent controls in order to forestall any hindrances to environmental conservation.

** TEQ (Toxic Equivalents)

This is the toxic equivalent conversion amount of 2, 3, 7, 8-tetrachloro dibenzo-p-dioxin (TCDD), the most harmful dioxin.

*** Dioxins generated during waste incineration



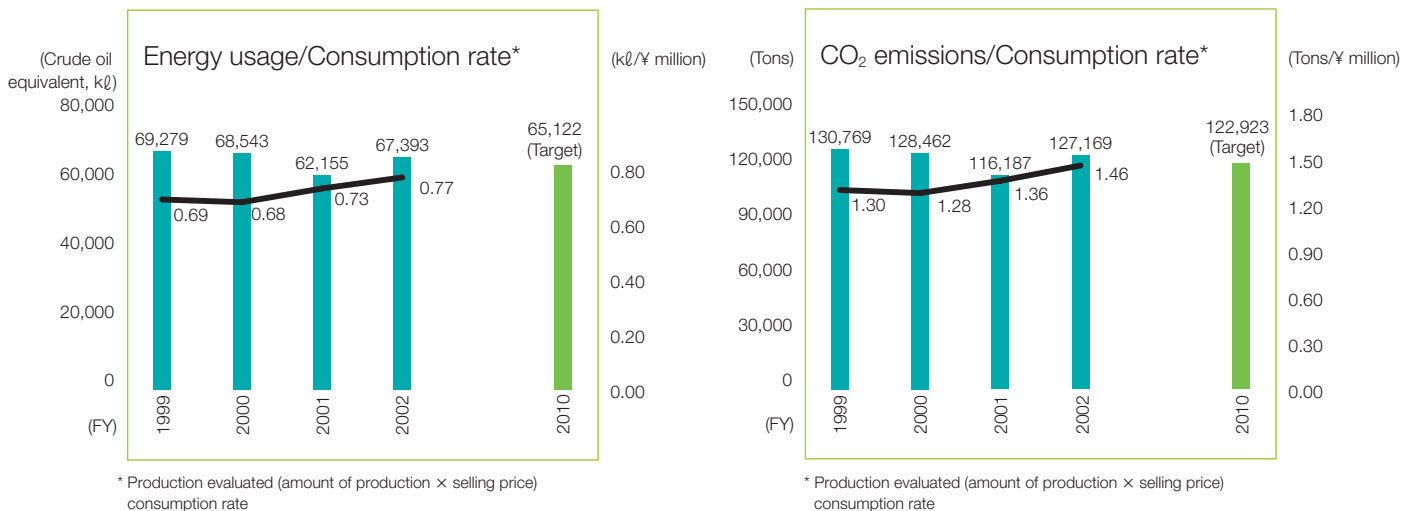
■ Sumitomo Bakelite implements energy conservation activities and strives to reduce CO₂ emissions.

The reduction of greenhouse gases is required to help achieve a solution to global warming, a worldwide environmental issue of the greatest concern. To reduce emissions of the greenhouse gas CO₂, the Sumitomo Bakelite Group strives to conserve energy by the following three means:

- ① Prevention of wasteful use of energy by all employees
- ② Promotion of energy-conserving production by rearranged producing processes
- ③ Adoption of new energy conservation technologies and equipment

We are further striving for energy conservation under the long-term objective of reducing CO₂ emissions by 6% from the fiscal 1999 level by fiscal 2010.

In fiscal 2002, we reduced CO₂ emissions by 2.8% from the fiscal 1999 level. However, in comparison with fiscal 2001, we produced a 9% (approximately 11,000 tons) increase in emissions as a result of the operation of equipment to curb the emission of solvents and others.



To reduce CO₂ emissions, Sumitomo Bakelite will install a cogeneration system in its Shizuoka Plant in fiscal 2004. This system generates electricity with a natural gas-powered turbine and also uses turbine exhaust heat as steam, and it is expected to reduce substantially the amount of energy usage and CO₂ emissions.

Principal energy conservation measures implemented in fiscal 2002 were:

- ① Adoption of energy-conserving compressors
- ② Upgrades of waste gas combustion units
- ③ Installation of steam heat recovery units
- ④ Use of energy-conserving lighting fixtures
- ⑤ Installation of solvent collection units
- ⑥ Installation of radiation heat isolation sheets



① Adoption of energy conserving compressors

The adoption of inverter-type compressors that are able to react to load fluctuations as well as the installation of devices to control the unit number have contributed to energy conserving operations. (Akita Sumitomo Bakelite Co., Ltd.)



② Upgrades of waste gas combustion units

Such measures as the elimination of unnecessary fittings and fixtures and the miniaturization of blowers in the pursuit of optimized operation for coating machines' waste gas combustion units has helped reduce electricity usage. (Artlite Kogyo Co., Ltd.)



③ Installation of steam heat recovery units

The installation of heat exchangers to the process of collecting steam drainage from coating machines for use as boiler water has improved collection rates. (Shizuoka Plant)



④ Use of energy conserving lighting fixtures

The use of mercury lamps with low-power consumption and greater brightness in comparison with conventional mercury lamps has reduced electricity usage. (Shizuoka Plant)



⑤ Installation of solvent recovery units

The cooling and recovery of methanol gas emitted from production processes as well as the reuse of the recovered gas as boiler fuel have curtailed emissions into the atmosphere, contributing to the reduction of crude oil consumption and CO₂ emissions. (Yamaroku Kasei Industry Co., Ltd.)



⑥ Installation of radiation heat isolation sheets

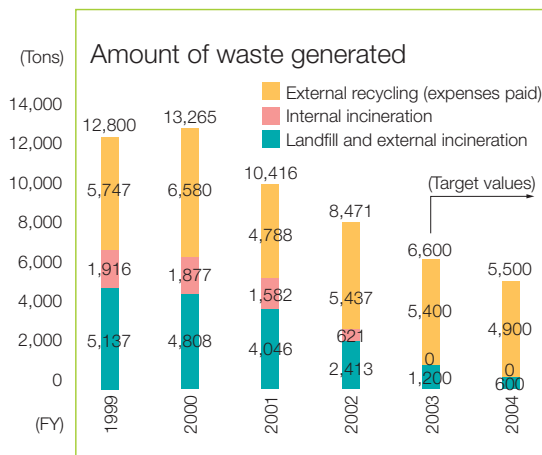
Placing a double "blue sheet" over warehouse windows cuts direct sunlight, and the amount of electricity consumed by air-conditioning units was also reduced. (Amagasaki Plant)

Waste Disposal



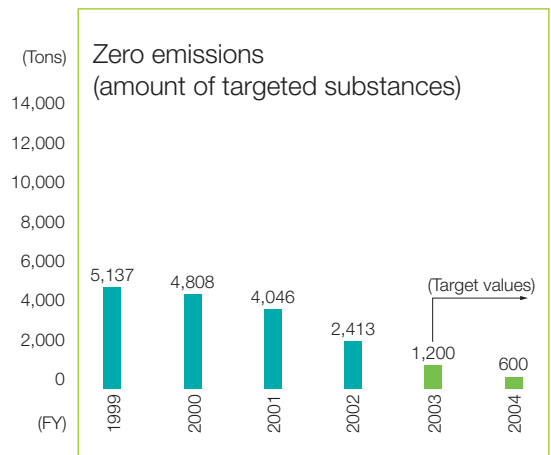
■ The Sumitomo Bakelite Group strives to reduce the amount of waste generated and achieve zero waste emissions.

The Sumitomo Bakelite Group is spearheading waste reduction with the saving and recycling of waste materials during the manufacturing processes. We are also aiming at recycling all waste generated, rather than using landfill or simple incineration, thereby achieving zero waste emissions. The graphs below illustrate progress in the reduction of waste generation and zero waste emissions efforts as well as the target figures. We have steadily reduced our waste generation since fiscal 2000 through saving waste materials, recycling, and conversion into valuable resources, and, in fiscal 2002, we achieved a year-on-year waste reduction of approximately 2,000 tons (19% down from fiscal 2001). We also reduced the wastes subject to our zero waste emissions programs by approximately 1,600 tons (40% down from fiscal 2001) through both internal and external recycling and valuable resource conversion. Our goal is to achieve zero waste emissions by fiscal 2005.



Note: The scope is 12 sites listed on p. 33.

Note: The waste consists of waste landfilled, external and internal incinerated, and external recycled (expenses paid).



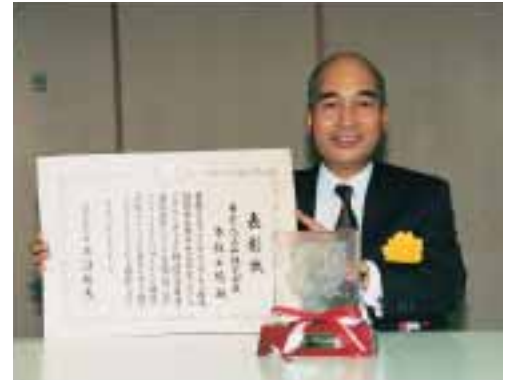
Note: The scope is 12 sites listed on p.33.

Note: Substances that count as zero emissions-targeted are the total amount of landfill waste and waste that is incinerated externally.

Waste disposal awards

- ① In October 2002, Tokyo Kakohin Co., Ltd., received an award for promoting the reduce, reuse, and recycle policy from Japan's Ministry of Economy, Trade, and Industry (METI) in recognition of its many years of recycling activities.

Tokyo Kakohin manufactures polyethylene resin shoetree blocks. The company's receipt of the METI award reflects its recycling activities, by which it collects shavings and filings from the machining of blocks as well as used blocks for conversion into raw materials for new shoetree blocks.



Tokyo Kakohin Co., Ltd., received an award for promoting the reduce, reuse, and recycle policy from Japan's Ministry of Economy, Trade, and Industry (METI).

- ② Yamaroku Kasei Industry Co., Ltd., continued to maintain zero waste emissions from April 2002 through August 2003, and has been certified as the Sumitomo Bakelite Group's first zero waste emissions plant.

Yamaroku Kasei Industry manufactures phenolic resin forming materials and achieved zero waste emissions through the thermal recycling of scrap material and thorough sorting of waste.



Commemorative tree planting for the achievement of zero waste emissions

Elimination of dioxins

Waste incinerators are one of the sources of dioxin emissions. With the Law Concerning Special Measures against Dioxins and the revision of the Waste Disposal and Public Cleaning Law, regulations governing incinerators have become more stringent, and Sumitomo Bakelite had eliminated all of its incinerators at its existing facilities by November 30, 2002.

Site	Status (as of August 2003)
Basic Research Institute	One unit use halted (Nov. 2000)
Shizuoka Plant	Five units eliminated (Nov. 2002)
Utsunomiya Plant	Two units eliminated (Nov. 2001)
Tsu Plant	One unit eliminated (Nov. 2001)
Artlite Industry	One unit eliminated (Aug. 2002)
Akita Sumitomo Bakelite	One unit eliminated (Nov. 2002)
Yamaroku Kasei Industry	One unit eliminated (Mar. 2000)



Sumitomo Bakelite proactively uses recycling as a means to make the most effective use of resources.

Regarding recycling initiatives, for many years, Sumitomo Bakelite has been pulverizing phenolic resin copper-clad laminates and melamine resin decorative laminates and using the powder as filler in phenolic resin molding compounds as well as re-pelletized sprue, runner, and other waste plastic from molded products as raw materials.

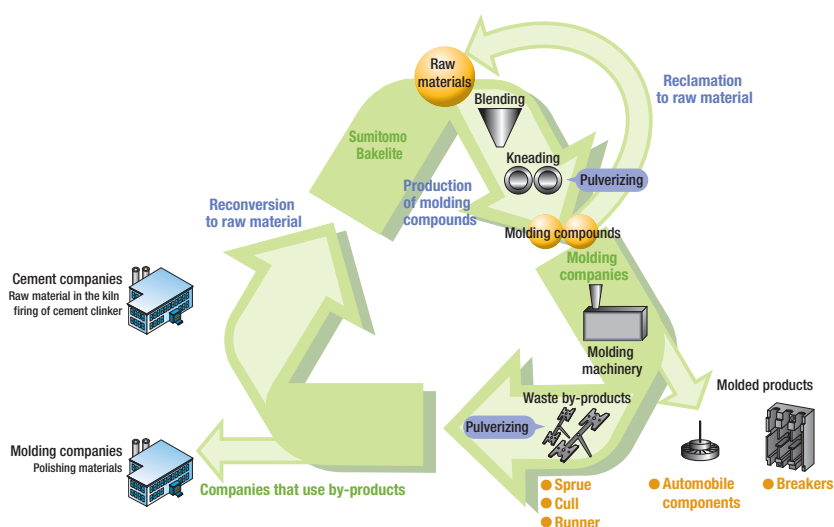
Some of Sumitomo Bakelite's other recycling initiatives include:

- Use of circuit etching waste liquid (copper chloride) as a base material for ship bottom paint
- Use of pre-preg from copper-clad laminates in fishing rods and rackets
- Reuse of epoxy resin molding products as raw material and fuel for cement
- Use of reactive waste liquid in raw fuel for cement (for caloric adjustment)
- Use of recovered methanol as boiler fuel
- Distillation, recycling, and reuse of waste acetone
- Reuse of waste isopropyl alcohol
- Recovery and recycling of used plastic shoe trees
- Use of paper and plastic scrap as refuse derived fuel
- Use of film sheet discard in trays, mats, planters, etc.
- Recovery of copper from organic and inorganic sludge

To recycle more efficiently, in 1992, we established the subsidiary S.B. Recycle Co., Ltd., whose missions are to research recycling technologies and the reuse of by-products and to build waste collection and processing systems for the Group and its customers. It is also conducting research into wastewater treatment systems for phenol resin dehydrate using biodegradation.

Recycling system for phenolic resin molding compound

Together with the collection of powder generated during molding production, a molding company also generates sprue, cull, and runner as by-products. Sumitomo Bakelite has established a recycling system that converts these by-products into raw material and fuel for cement plants and also pulverizes some of them for reuse as polishing materials. We are also conducting research into the chemical recycling of thermoset resin molding materials using supercritical technologies.



Results of Groundwater and Soil Contamination Surveys



■ Sumitomo Bakelite conducts surveys of groundwater and soil contamination.

The following table contains the results of groundwater and soil surveys conducted at each office and facility. As of these surveys, no contaminants that exceeded the limits set by environmental standards have been detected.

Site	Survey item	Result*1	Comments	Survey date	
Fundamental Research Institute	Groundwater and soil	1,1,1-trichloroethane	A		12/98
		Trichloroethylene	A		
		Tetrachloroethylene	A		
Amagasaki Plant	Groundwater	1,1,1-trichloroethane	A	★ Although 0.24mg/l of cis-1,2-dichloroethylene was detected (environmental standard: 0.04mg/l), a municipal survey found the cause to be upstream of the plant.	9/00
		Trichloroethylene	A		
Tetrachloroethylene		A			
Carbon tetrachloride		A			
1,1-dichloroethylene		A			
Cis-1,2-dichloroethylene		★			
Soil	Cadmium and its compounds	A		11/00	
	Lead and its compounds	A			
	Hexavalent chromium compounds	A			
	Arsenic and its compounds	A			
	Mercury and its compounds	A			
Shizuoka Plant	Groundwater	23 substances designated by environmental standards ²	A		3/00
	Soil	Trichloroethylene	A		2/99
Utsunomiya Plant	Groundwater and soil	Trichloroethylene	A		5/00
Tsu Plant	Groundwater	23 substances designated by environmental standards ²	A		2/00
	Soil	25 substances designated by environmental standards ³	A**	** Taken from near outdoor hazardous material storage facility. 230mg/kg of copper was detected (2/00) (environmental standard: 125mg/kg), but this is presumed to have leaked during processing of waste oil containing copper. Although subsequent surveys detected only 67mg/kg (7/02) and 62mg/kg (6/03).	2/00
Yamaroku Kasei Industry Co., Ltd.	Groundwater	22 substances, including trichloroethylene	A		1/02
	Soil	Phenols	A		10/01
Akita Sumitomo Bakelite Co., Ltd.	Groundwater	Total cyanide, lead, copper, soluble manganese, phenols, cis-1,2-dichloroethylene, 1,1,1-trichloroethane, tetrachloroethylene, dichloromethane, trichloroethylene	A		7/01
			A		
		A			
Soil	Cyanide	A		8/00	
	Phenols	A			
	Copper	A			
	Manganese	A			
	n-hexane extract	A			
(Former Sano Plastic Co., Ltd.)	Groundwater	Trichloroethylene	A		7/98

Notes: *1. A indicates that limits set by environmental standards have been cleared.

*2. Cadmium, total cyanide, lead, hexavalent chromium, arsenic, total mercury, alkyl mercury, PCB, dichloromethane, carbon tetrachloride, 1,2-dichloroethane, 1,1-dichloroethylene, cis-1,2-dichloroethylene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, trichloroethylene, tetrachloroethylene, 1,3-dichloropropene, tiuram, simazine, thiobencarb, benzene, selenium

*3. Cadmium, total cyanide, organic phosphorus, lead, hexavalent chromium, arsenic, total mercury, alkyl mercury, PCB, dichloromethane, carbon tetrachloride, 1,2-dichloroethane, 1,1-dichloroethylene, cis-1,2-dichloroethylene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, trichloroethylene, tetrachloroethylene, 1,3-dichloropropene, tiuram, simazine, thiobencarb, benzene, selenium

Site-Specific Environmental Impact Data



The tables below provide environmental impact data for each individual Sumitomo Bakelite site.

Amagasaki Plant

(Air)

Facility	Item	Unit	Regulatory limit	Measured data
Boiler	SO _x	m ³ N/h	2.93	0.12
	NO _x	ppm	250	53.7
	Soot and dust	g/m ³ N	0.3	0.04

(Water)

Item	Unit	Regulatory limit	Measured data
pH	—	5.8–8.6	7.2–7.9
BOD	mg/l	25	7.5
COD	mg/l	25	7.5
Suspended substances	mg/l	20	1.8
n-hexane extract	mg/l	20	1.2

Utsunomiya Plant

(Air)

No relevant facilities

(Water)

Item	Unit	Regulatory limit	Measured data
pH	—	5.8–8.6	7.4–7.9
BOD	mg/l	25	1.3
COD	mg/l	25	3.5
Suspended substances	mg/l	25	Less than 1
n-hexane extract	mg/l	5	Less than 1

Fundamental Research Laboratory

(Air)

No relevant facilities

(Water)

Item	Unit	Regulatory limit	Measured data
pH	—	5–9	7.1–7.9
Copper	mg/l	3	0.07
Soluble iron	mg/l	10	0.2
Nickel	mg/l	1	Less than 0.05

Shizuoka Plant

(Air)

Facility	Item	Unit	Regulatory limit	Measured data
Boiler	SO _x	m ³ N/h	17.72	13.4
	NO _x	ppm	140	110
	Soot and dust	g/m ³ N	0.1	0.002

(Water)

Item	Unit	Regulatory limit	Measured data
pH	—	5.8–8.6	6.8–7.4
BOD	mg/l	15	5.8
COD	mg/l	—	4.3
Suspended substances	mg/l	30	7.2
n-hexane extract	mg/l	3	1.6
Phenols	mg/l	1	Less than 0.2
Formaldehyde	mg/l	5	0.7
Copper	mg/l	0.05	Less than 0.05
Total chromium	mg/l	0.05	Less than 0.05
Hexavalent chromium	mg/l	0.05	Less than 0.05
Zinc	mg/l	0.1	Less than 0.05
Dichloromethane	mg/l	0.02	Less than 0.02

Tsu Plant

(Air)

No relevant facilities

(Water)

Item	Unit	Regulatory limit	Measured data
pH	—	5.8–8.6	6.3–7.3
BOD	mg/l	130	9
COD	mg/l	130	20
Suspended substances	mg/l	130	12
Phenols	mg/l	1	Less than 0.1
Copper	mg/l	1	Less than 0.05
Total chromium	mg/l	2	Less than 0.05
Zinc	mg/l	5	0.13
Soluble iron	mg/l	10	0.29
Soluble manganese	mg/l	10	Less than 0.05
Total nitrogen	mg/l	60	23.0
Total phosphorus	mg/l	8	2.30

Kobe Fundamental Research Laboratory

(Air)

No relevant facilities

(Water)

Item	Unit	Regulatory limit	Measured data
pH	—	5–9	7.9–8.7
BOD	mg/l	2,000	25
COD	mg/l	—	26
Suspended substances	mg/l	2,000	5
n-hexane extract	mg/l	5	Less than 1.0
Phenols	mg/l	5	Less than 0.2
Zinc	mg/l	0.7	0.06

Akita Sumitomo Bakelite Co., Ltd.

(Air)

Facility	Item	Unit	Regulatory limit	Measured data
Boiler	SO _x	m ³ N/h	10.5	1.12
	NO _x	ppm	110	100
	Soot and dust	g/m ³ N	0.09	Less than 0.01

(Water)

Item	Unit	Regulatory limit	Measured data
pH	—	6.0–8.5	6.7–7.2
BOD	mg/l	30	20
COD	mg/l	30	14
Suspended substances	mg/l	40	6
Phenols	mg/l	0.5	0.02
Copper	mg/l	1.0	0.34–0.92
Cyanide	mg/l	0.1	Less than 0.01
Lead and lead compounds	mg/l	0.1	Less than 0.01
Soluble manganese	mg/l	5	Less than 0.03

Tokyo Kakohin Co., Ltd.

(Air)

No relevant facilities

(Water)

Item	Unit	Regulatory limit	Measured data
pH	—	5.8–8.6	8.2–8.6
BOD	mg/l	20	3.7
COD	mg/l	—	9.3
Suspended substances	mg/l	50	9.0

Kyushu Bakelite Industry Co., Ltd.

(Air)

No relevant facilities

(Water)

Item	Unit	Regulatory limit	Measured data
pH	—	5.8–8.6	7.1–7.5
BOD	mg/l	30	7.4
COD	mg/l	20	8.6
Suspended substances	mg/l	20	Less than 5
n-hexane extract	mg/l	2	Less than 1

Artlite Kogyo Co., Ltd.

(Air)

Facility	Item	Unit	Regulatory limit	Measured data
Boiler	SO _x	m ³ N/h	4.60	0.04
	NO _x	ppm	180	72
	Soot and dust	g/m ³ N	0.30	0.0016

(Water)

Item	Unit	Regulatory limit	Measured data
pH	—	5.8–8.6	6.5–8.0
BOD	mg/l	160	2.0
COD	mg/l	30	4.0
Suspended substances	mg/l	200	2.7
n-hexane extract	mg/l	5	2.5
Phenols	mg/l	5	2

Yamaroku Kasei Industry Co., Ltd.

(Air)

No relevant facilities

(Water)

Item	Unit	Regulatory limit	Measured data
pH	—	5.8–8.6	7.0–7.3
BOD	mg/l	25	1.1
COD	mg/l	25	3.5
Suspended substances	mg/l	90	2.3
Phenols	mg/l	1	Less than 0.01

- Notes: 1. Regarding facilities related to air quality, in cases where there are multiple facilities subject to regulations, the facility with the largest volume of gas emissions is listed.
2. Regarding limits placed by the various regulations stipulated by prefectural ordinances, community agreements, and government counsel, the most rigorous are listed.
3. For actual measurements, the largest figures for fiscal 2002 have been listed. For pH measurements, the range from smallest to largest measurements is listed.
4. Actual measurements that are listed as "less than" indicate a measurement smaller than the lowest fixed value.

Sumitomo Bakelite discloses data on the air- and water-related environmental impact of its overseas affiliates

Sumitomo Bakelite Singapore Pte. Ltd. (Singapore)

(Air)

No relevant facilities

(Water)

Item	Unit	Regulatory limit	Measured data
pH	—	6–9	6.8
BOD	mg/l	400	258
COD	mg/l	600	315
Suspended substances	mg/l	400	102
Phenols	mg/l	0.5	0.1
Temperature	C°	45	29.5
Chlorine	mg/l	1,000	86
Hydrosulfate	mg/l	1,000	44
Sulfur	mg/l	1	Less than 0.1
Cyanide compounds	mg/l	2	0.04
Linear alkylate sulphonate	mg/l	30	8.1
Oil and grease	mg/l	60	33
Arsenic and its compounds	mg/l	5	Less than 0.1
Barium	mg/l	10	Less than 0.5
Tin	mg/l	10	Less than 0.1
Soluble iron	mg/l	50	0.9
Beryllium	mg/l	5	Less than 0.05
Boron	mg/l	5	Less than 0.2
Soluble manganese	mg/l	10	Less than 0.02
Cadmium	mg/l	1	Less than 0.05
Trivalent chromium	mg/l	5	Less than 0.1
Hexavalent chromium	mg/l	5	Less than 0.1
Copper	mg/l	5	0.1
Lead	mg/l	5	Less than 0.2
Mercury	mg/l	0.5	Less than 0.001
Nickel	mg/l	10	Less than 0.1
Selenium	mg/l	10	Less than 0.2
Silver	mg/l	5	Less than 0.02
Zinc	mg/l	10	2.6

P.T. Indopherin Jaya (Indonesia)

(Air)

Facility	Item	Unit	Regulation limit	Measured data
Generator	NO ₂	m ³ N/h	0.05	0.02
	SO ₃	ppm	0.1	0.014
	Soot and dust	g/m ³ N	0.26	0.2
	NH ₃	ppm	2	0.59
	CO	ppm	20	2.75
	H ₂ S	ppm	0.03	0.009
	O ₃	ppm	0.1	0.08

(Water)

Item	Unit	Regulatory limit	Measured data
pH	—	6–9	7–8
BOD	mg/l	100	24
COD	mg/l	300	66
Suspended substances	mg/l	100	3
Total nitrogen	mg/l	30	2.7
Phenols	mg/l	1	0

Sumitomo Bakelite (Taiwan) Co., Ltd. (Taiwan)

(Air)

No relevant facilities

(Water)

Item	Unit	Regulatory limit	Measured data
pH	—	6–9	7.6–7.8
BOD	mg/l	300	105
COD	mg/l	600	356
Suspended substances	mg/l	300	62



SNC Industrial Laminates Sdn. Bhd. (Malaysia)

(Air)

Facility	Item	Unit	Regulation limit	Measured data
Odour	SO _x	g/m ³ N	0.2	0.0005
	NO _x	g/m ³ N	2.0	0.0456
Thermal	Soot and dust	g/m ³ N	0.4	0.0267
Oxidizer	Formaldehyde	g/m ³ N	0.037	0.0006

(Water)

Item	Unit	Regulatory limit	Measured data
pH	—	5.5–9.0	6.0–9.3*
BOD	mg/l	50	45
COD	mg/l	100	95
Suspended substances	mg/l	100	30
Phenols	mg/l	1.0	Less than 0.1
Temperature	C°	40	32
Mercury and its compounds	mg/l	0.05	Less than 0.02
Cadmium and its compounds	mg/l	0.02	Less than 0.02
Hexavalent chromium compounds	mg/l	0.05	Less than 0.05
Arsenic and its compounds	mg/l	0.05	Less than 0.05
Cyanide compounds	mg/l	0.10	Less than 0.05
Lead and its compounds	mg/l	0.10	Less than 0.1
Trivalent chromium compounds	mg/l	0.5	Less than 0.1
Copper	mg/l	1.0	0.1
Soluble manganese	mg/l	1.0	Less than 0.1
Nickel	mg/l	1.0	0.1
Tin	mg/l	1.0	Less than 0.1
Zinc	mg/l	1.0	0.4
Boron	mg/l	4.0	Less than 0.2
Soluble iron	mg/l	5.0	0.7
Chlorine	mg/l	2.0	Less than 0.1
Sulfur	mg/l	0.50	Less than 0.4
Oil and grease	mg/l	10.0	9

* Although a maximum value of 9.3 was measured, the result of a remeasurement was 8.7. The cause of this exceeding of the regulatory limit was that the measurement was taken during boiler blow. Neutralization devices have been installed as a countermeasure.

S.B. Flex Philippines Inc. (Philippines)

(Air)

No relevant facilities

(Water)

Item	Unit	Regulatory limit	Measured data
pH	—	6.5–9.0	6.7–7.6
BOD	mg/l	500	482
COD	mg/l	800	520
Suspended substances	mg/l	350	84

N.V. Durez Europe S.A. (Belgium)

(Air)

Facility	Item	Unit	Regulation limit	Measured data
Boiler	NO _x	mg/m ³ N	425	205

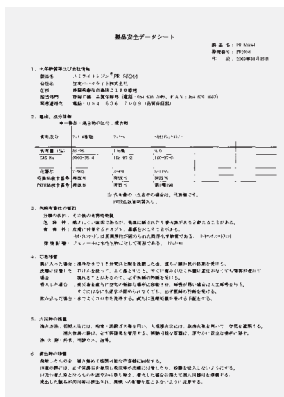
(Water)

Item	Unit	Regulatory limit	Measured data
pH	—	6–9	6.3–7.7
BOD	mg/l	—	Less than 5
COD	mg/l	136	Less than 15
Suspended substances	mg/l	1,000	8
TOC	mg/l	50	4.3
Phenols	mg/l	3	Less than 1
Chlorendic acid	mg/l	3	Less than 0.1
Hexachloro-cyclopentadiene	mg/l	0.005	Less than 0.005
Monochloro-benzene	mg/l	5	Less than 1
Total nitrogen	mg/l	15	Less than 1.8
Total phosphorus	mg/l	3	0.63





Material Safety Data Sheet (MSDS)



MSDS

An MSDS provides significant information to ensure the safe use and handling of chemical substances and products. The enactment of the PRTR Law and the revision of the Industrial Safety and Health Law and the Poisonous and Deleterious Substances Control Law have made the provision of MSDSs a legal obligation. Sumitomo Bakelite has always drawn up and distributed MSDSs based on JCIA guidelines. However, with the revision to these laws as well as the adoption of the JIS Z 7250 for the preparation of MSDSs, we are currently revising our MSDS procedures. For products that are exported, we are working to prepare MSDSs in the local language as well as provide information pertaining to local laws. We also demand MSDSs for all raw materials that we purchase. These MSDSs are made constantly available to the site where these materials are handled, and MSDS-based safety education is provided for all employees involved.



Yellow card

Yellow Cards (Emergency Contact Cards)

To ensure safety during transport, drivers carry “yellow cards” at all times. These cards contain information about emergency measures and contacts.

Audit

Since 1973, Sumitomo Bakelite has been implementing annual environmental and safety auditing of its facilities through the Environment, Safety, and Recycling Department. In 1978, the scope of these audits was expanded to include domestic affiliates. The scope was further expanded in 1993 to include audits of manufacturing affiliates in other parts of Asia. In accordance with the principles of Responsible Care, audits are conducted on the state of maintenance and improvement of environment- and safety-related administration systems as well as on observance and implementation of legal regulations. These audits are implemented through documentation as well as on-site inspections. Each individual site also implements regular audits and strives to maintain and improve its systems in compliance with ISO 14001-based environmental management systems.



Environmental and safety audits conducted by the Environment, Safety, and Recycling Department

Fiscal 2002 Safety and Environment Audit Results (Conducted at four plants, two laboratories, and six domestic affiliates)

	No. of items	Current progress
Action pointed out	9	Situation corrected
Action advised	26	Situation corrected
Action demanded	40	Situation corrected

Fiscal 2002 ISO 14001 Audit Results

Audit by “Approved Registration Body”	Initial assessment	Approval registered for one establishment
	Surveillance	Registration maintained at eight establishments
Internal audit		Implemented at nine establishments All actions pointed out have been corrected

Environmental education

Each Sumitomo Bakelite office and facility conducts environmental education courses at three levels geared for new recruits, middle-ranking employees, and veteran employees. The Company makes every effort to ensure that these curricula result in structured and continual education. The primary content of these courses includes environmental issues surrounding the Company (and individual offices and facilities), environmental policies, targets, and objectives at the office and departmental level, the handling of hazardous substances, organic solvents, poisonous materials, and MSDS-based handling of chemical substances.

S.B. Techno-Research Co., Ltd., has compiled textbooks for education on laws pertaining to chemical substances and the correct handling of chemical products. The Company will be putting these textbooks to use in its environmental education programs.

区分	環境一般教育訓練	環境部門教育訓練	環境特定業務教育訓練	環境重点業務教育訓練
対象部門	新入社員 転勤者 退職者 環境担当職員 従業員	新入社員 転勤者 退職者 環境担当職員 従業員	新入社員 転勤者 退職者 環境担当職員 従業員	新入社員 転勤者 退職者 環境担当職員 従業員
対象業務	環境一般教育訓練	環境部門教育訓練	環境特定業務教育訓練	環境重点業務教育訓練
対象者	新入社員 転勤者 退職者 環境担当職員 従業員	新入社員 転勤者 退職者 環境担当職員 従業員	新入社員 転勤者 退職者 環境担当職員 従業員	新入社員 転勤者 退職者 環境担当職員 従業員
講師	環境担当職員 各部門内訓練担当者	環境担当職員 各部門内訓練担当者	環境担当職員 各部門内訓練担当者	環境担当職員 各部門内訓練担当者
教育内容	環境マネジメントの意義 環境マネジメントの目的 環境マネジメントの役割 環境マネジメントの推進	環境マネジメントの意義 環境マネジメントの目的 環境マネジメントの役割 環境マネジメントの推進	環境マネジメントの意義 環境マネジメントの目的 環境マネジメントの役割 環境マネジメントの推進	環境マネジメントの意義 環境マネジメントの目的 環境マネジメントの役割 環境マネジメントの推進
教材	環境マネジメントの意義 環境マネジメントの目的 環境マネジメントの役割 環境マネジメントの推進	環境マネジメントの意義 環境マネジメントの目的 環境マネジメントの役割 環境マネジメントの推進	環境マネジメントの意義 環境マネジメントの目的 環境マネジメントの役割 環境マネジメントの推進	環境マネジメントの意義 環境マネジメントの目的 環境マネジメントの役割 環境マネジメントの推進
実施時期	新入社員研修 転勤者研修 退職者研修 環境担当職員研修 従業員研修	新入社員研修 転勤者研修 退職者研修 環境担当職員研修 従業員研修	新入社員研修 転勤者研修 退職者研修 環境担当職員研修 従業員研修	新入社員研修 転勤者研修 退職者研修 環境担当職員研修 従業員研修
実施場所	本社 各工場 各事業所	本社 各工場 各事業所	本社 各工場 各事業所	本社 各工場 各事業所
実施回数	1回/年 1回/年 1回/年 1回/年 1回/年	1回/年 1回/年 1回/年 1回/年 1回/年	1回/年 1回/年 1回/年 1回/年 1回/年	1回/年 1回/年 1回/年 1回/年 1回/年

区分	環境一般教育訓練	環境部門教育訓練	環境特定業務教育訓練	環境重点業務教育訓練
実施時期	2024年1月	2024年2月	2024年3月	2024年4月
実施場所	本社	各工場	各事業所	本社
実施回数	1回/年	1回/年	1回/年	1回/年
実施担当者	環境担当職員	環境担当職員	環境担当職員	環境担当職員
実施内容	環境一般教育訓練	環境部門教育訓練	環境特定業務教育訓練	環境重点業務教育訓練
実施結果	環境一般教育訓練	環境部門教育訓練	環境特定業務教育訓練	環境重点業務教育訓練
実施評価	環境一般教育訓練	環境部門教育訓練	環境特定業務教育訓練	環境重点業務教育訓練
実施改善	環境一般教育訓練	環境部門教育訓練	環境特定業務教育訓練	環境重点業務教育訓練

Examples of annual environmental education curricula

Emergency training

In anticipation of fires, leakage, and other environmental emergencies, each site conducts training to counter such emergencies.



Initial fire-extinguishing training



Initial fire-extinguishing training



Emergency action training



Elimination of Use of CFCs

The chlorofluorocarbon CFC-113 as well as 1,1,1-trichloroethane have been identified as ozone layer-depleting substances, and the Sumitomo Bakelite Group ceased using these substances entirely in 1994. Both were used as cleansers, but have been replaced with alcohol- and hydrocarbon-based alternatives. Furthermore, although the chlorofluorocarbon substitute HCFC-22 and the chlorofluorocarbon CFC-12 have been used as coolants in refrigeration units, in accordance with the Law Concerning the Recovery and Destruction of Fluorocarbons, which was enacted in fiscal 2001, we are steadily working to replace these substances with alternatives.

PCB management

As of fiscal 2002, there were four Sumitomo Bakelite facilities that have electric machinery (condensers) that contain PCBs in use or in storage. With the liquidation of Sano Plastic Co., Ltd., in accordance with the prescribed procedures, the Company informed government authorities of the transfer of the four condensers previously held by Sano Plastic, which were then relocated to the Shizuoka Plant. Condensers in storage are kept in specialized vaults and strictly monitored to prevent any leakage or misplacement. In the near future, in accordance with the Law for the Promotion of Environmentally Sound Destruction of PCB Waste, we will steadily dispose of these condensers. We are also currently working to replace lighting fixtures with stabilizers that use PCB alternatives.

PCB condensers

Site	Units in use	Units in storage
Shizuoka Plant	1	61
Tsu Plant	4	0
Hokkai Taiyo Plastic Co., Ltd.	0	2
Yamaroku Kasei Industry Co., Ltd.	0	4
Total	5	67

Lighting fixtures with PCB stabilizers

Site	Units in use	No. of units in use converted to alternative stabilizers
Fundamental Research Laboratory	0	123
Amagasaki Plant	0	39
Shizuoka Plant	54	176
Tsu Plant	0	131
Artlite Kogyo Co., Ltd.	0	6
Total	54	475

* Upon reexamination, a miscount of the number of units in use was discovered. Unit numbers for the *Environmental Report 2002* have therefore been revised.



PCB storage

Overview of environmental claims and response

In accordance with ISO 14001, the Company responds to environment-related complaints. Five such complaints were received during fiscal 2002, the contents of which, along with the Company's response, are outlined below.

Category	Date	Facility	Details of complaint	Cause and solution
① Noise	May 2002	Amagasaki Plant	Noise like alarm klaxons	Alarm devices were replaced, and their replacement was reported to the local residents' association. No subsequent complaints were received.
② Noise	July 2002	Shizuoka Plant	Noises resembling the release of steam	The clogging of a pressure detection pipe was causing steam. It was released from the safety valve while accumulator pressure was building up. The pipe in question was replaced and countermeasures against possible reoccurrence were taken. These actions satisfied the person who reported the complaint.
③ Noise	September 2002	Artlite Industry	A high-pitched squeaking noise	Sound proofing devices were installed in the blowers that were thought to be the cause of the noise. No subsequent complaints were received.
④ Scattering of sprayed resin dust	January 2003	Shizuoka Plant	Dirt settling on cars parked in nearby plant	A sprayed resin mist was released from the ruptured base of a reaction vessel caused by the rise of internal pressure. The Company apologized, removed the resin dust, and washed and otherwise restored the cars to their original condition. To prevent reoccurrence, a buffer tank was installed at the end of the ruptured base.
⑤ Scattered grass	August 2002	Fundamental Research Laboratory	Grass scattered throughout the neighborhood	Strong winds blew grass that had been cut and collected from the grounds of the laboratory. The Company removed the grass, cleaned up the affected areas, and made an apology.



■ The Sumitomo Bakelite Group engages in “green purchasing,” which is the placing of priority on goods with minimum environmental impact in purchasing operations.

Purchasing operations that place priority on goods and services with minimum environmental impact, rather than simply price and quality, are known as “green purchasing.” The Law Concerning the Promotion of Procurement of Eco-Friendly Goods and Services by the State and Other Entities (Law on Promoting Green Purchasing) went into effect in April 2001, thus establishing green purchasing as the responsibility of the state and other institutions. Sumitomo Bakelite has been conducting green purchasing for several years, primarily of office supplies. However, without any unified standard, these efforts were implemented on an individual basis by each department. Now, with the enforcement of the Law on Promoting Green Purchasing, a basic policy has been disclosed, which we used as the basis for our Green Purchasing Standards that we enacted in April 2001.

The table below outlines the purchasing standards for three items: paper, office supplies, and OA equipment. Under our Environmental Accounting Compilation Guidelines, the cost for green purchasing is categorized in “Reduction of environmental burden upstream and downstream” and it is recognized only when the green product is more expensive than the conventional product owing to the additional cost associated with being environmentally friendly. However, since the price differences have narrowed to negligible levels, such additional costs for green purchasing were not identified in our environmental conservation costs for fiscal 2002.

Item		Purchasing standards
Paper	Data paper (copier paper, etc.)	100% recycled paper content with 70% or lower degree of whiteness
	Printing paper	70% or greater recycled paper content
Office supplies	Overhead projector film	30% or greater recycled plastic content
	Business envelopes	40% or greater recycled paper content
	Notebooks	70% or greater recycled paper content
OA equipment	Copiers	Units with energy conservation, sleep mode, and double-sided printing features
	Printers, fax machines	Selected based on level of energy conservation



Contributions to Social Activities



■ Each office and facility of the Sumitomo Bakelite Group strives to be a corporation with an open attitude toward society and proactively implements interaction with its surrounding communities through a variety of activities.



The Company hosted the community dialogue conference on Responsible Care for the Hyogo region. (Amagasaki Plant)



Plant tours were held as a part of the local junior high school environmental education program. (Shizuoka Plant)



The Company received an award from Indonesian President Megawati Sukarnoputri for the achievement of three consecutive accident-free years of operations. (P.T. Indopherin Jaya)



The Company cosponsored the local tulip festival and participated in the planting of tulip bulbs. (Kyushu Bakelite Industry Co., Ltd.)



The tulips were in beautiful full bloom in April. (Kyushu Bakelite Industry Co., Ltd.)



The Company donated old wooden cargo pallets to a local elementary school. The school then used the wood to make desks, chairs, shelves, and other items. (S.B. Flex Philippines, Inc.)



The Company received an award from the Red Cross Society of Japan for 20 years of continual support for blood donations. (Fundamental Research Laboratory)



Resins from used rubber gloves were recycled and made into planters and donated to a local elementary school. (Kyushu Bakelite Industry Co., Ltd.)



■ Sumitomo Bakelite assembles an environmental management system by attaining ISO 14001 certification.

As part of its Responsible Care activities, the Sumitomo Bakelite Group has assembled an ISO 14001-based environmental management system and is pushing through ISO 14001 certification. Already, nine domestic sites and nine overseas sites have been certified, and we are now making preparations to attain certification for our laboratories as well.

Certified sites are indicated on the map below.



Notes: 1. Dates of certification are indicated in parentheses.
2. Sites in bold are those of the parent company.

History of Environmental Conservation Activities



History of the Sumitomo Bakelite Group's environmental conservation activities

Year	Sumitomo Bakelite's initiatives	Social developments
1967		• Basic Law for Environmental Pollution Control enacted
1968		• Air Pollution Control Law and Noise Regulation Law enacted
1969	• Pollution countermeasure secretariat established	
1970		• Water Pollution Control Law and Waste Management and Public Cleansing Law enacted
1971		• Environmental Agency established
1972		• Club of Rome announces "the limit to growth" • United Nations Conference on the Human Environment held in Stockholm; Declaration of the United Nations Conference on the Human Environment adopted
1973	• Environmental Management Division established • Environmental auditing of domestic in-house facilities commenced	
1974	• Environmental Management sections established for each business facility	
1978	• Environmental auditing of domestic affiliates commenced	
1979		• Law Concerning the Rational Use of Energy enacted
1985		• The Vienna Convention for the Protection of the Ozone Layer adopted
1987		• Montreal Protocol on Substances That Deplete the Ozone Layer adopted
1989		• Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal adopted
1990	• Environment Issue Action Committee established • Directors in charge of safety and environment appointed	
1991	• Recycling Technologies Action Office established	• Law Promoting the Use of Recycled Resources enacted
1992	• S.B. Recycle Co., Ltd., established	• U.N. Conference on Environment and Development ("Earth Summit") held
1993	• Environment and Safety Volunteer Plan formulated • Environment and Safety Management Regulations drawn up • Environmental auditing of overseas affiliates commenced	• The Basic Environment Law enacted
1994	• Use of specific CFCs and 1,1,1-trichloroethane eliminated	
1995	• Responsible Care Committee established • The Company joins the Japan Responsible Care Council as a founding member	• The Japan Responsible Care Council established • Law for Promotion of Sorted Collection and Recycling of Containers and Packaging
1996		• ISO 14001 issued
1997	• "Corporate Policies for Safety, Health and the Environment" revised • The Utsunomiya Plant and Sumitomo Bakelite Singapore attain ISO 14001 certification	• Kyoto Protocol adopted by the Third Conference of the Parties of the UN Framework Convention on Climate Change (COP 3)
1998	• First Environmental Activities Report issued	
1999	• ISO 14001 certification attained by all Sumitomo Bakelite plants	• Law Concerning Reporting, etc. of Releases to the Environment of Specific Chemical Substances and Promoting Improvements in their Management enacted • Law Concerning Special Measures against Dioxins enacted
2000	• Environmental accounting adopted	• Basic Law for Establishing the Recycling-based Society enacted
2001	• Environmental Report issued (with independent review report)	
2002	• Scope of Environmental Report coverage expanded to include all domestic facilities • Tokyo Kakohin Co., Ltd., receives the award for promoting the reduce, reuse, and recycle policy	• Soil Contamination Countermeasures Law enacted • Japan accepted COP 3 Kyoto Protocol
2003	• Yamaroku Kasei Industry Co., Ltd., becomes the Sumitomo Bakelite Group's first zero waste emissions plant. • 18 Sumitomo Bakelite production bases, both in Japan and overseas, attain ISO 14001 certification (as of August 2003)	• Building Code revised as a means to counter the "sick house" phenomenon

Items in blue print are worldwide developments



Asahi & Co

Independent Review Report on the “Environmental Report 2003”

To the Board of Directors of SUMITOMO BAKELITE CO., LTD.

1. Purpose and Scope of our Review

We have reviewed the “Environmental Report 2003” (the “Environmental Report”) of SUMITOMO BAKELITE CO., LTD. (the “Company”) for the year ended March 31, 2003. The review consisted of performing certain procedures as described below in relation to the collection, compilation and calculation of the information included in the Environmental Report. As this is the third year of our review, any indicators for years prior to the year ended March 31, 2001 were not subject to these procedures.

Our work does not constitute an audit or examination. We therefore do not express an opinion on the accuracy or completeness of the indicators or databases used to compile the information or the representations made by the Company in the Environmental Report.

2. Procedures Performed

We have performed the following review procedures agreed to by the Company’s management;

- 1) Obtained the environmental information supporting the environmental performance indicators and the environmental accounting indicators for the purpose of understanding the processes and the procedures of the Company for collecting the data information used to compile the Environmental Report.
- 2) With respect to the environmental performance indicators and the environmental accounting indicators in the Environmental Report, tested quantitative accuracy of the indicators on a sample basis and compared them on a sample basis with the supporting data compiled from the information collected by the Company.
- 3) With respect to the descriptive information in the Environmental Report other than the indicators referred to in the above procedures, interviewed the Company’s responsible personnel, made an on-site inspection of a factory and compared such descriptive information with the data collected by the Company or the data found in certain published materials.

3. Results of the Procedures Performed

As a result of the procedures performed;

- 1) We are not aware of any material modifications that should be made to the environmental performance indicators or the environmental accounting indicators in the Environmental Report in order for them to comply with the Company’s policies and procedures for gathering and reporting such information.
- 2) We are not aware of any material modifications that should be made to the descriptive information other than the indicators in the Environmental Report to be consistent with the information the Company collected and other information we obtained.

Asahi & Co

Tokyo, Japan
September 4, 2003

Corporate Data



Name

Sumitomo Bakelite Co., Ltd.

President

Tsuneo Moriya

Established

January 25, 1932

Capital (as of March 31, 2003)

¥27.1 billion

No. of shareholders

(as of March 31, 2003)

17,070

No. of employees

(as of March 31, 2003)

2,406

Net sales (fiscal 2001)

¥ 95.0 billion (non-consolidated)

¥160.4 billion (consolidated)

Major products (categorized by division)

Semiconductor and display materials

- Epoxy resin molding compounds
- Liquid resin for semiconductors
- Carrier tape for semiconductor surface mounting
- Adhesive tape for semiconductor chip devices

Materials for circuitry and electronic components

- Epoxy resin copper clad laminates
- Phenol resin copper clad laminates*
- Flexible printed circuits*

Advanced plastics

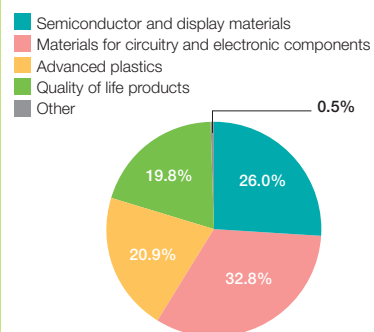
- Phenol resin molding compound
- Polyvinyl resin molding compound*
- Urea and melamine resin adhesives*
- Industrial-use phenol resin
- Formalin
- Precision molded products
- Precision molding dies

Quality of life products

- Medical instruments*
- Melamine resin decorative laminates*
- Polyvinyl resin sheets*
- Multilayer film sheets

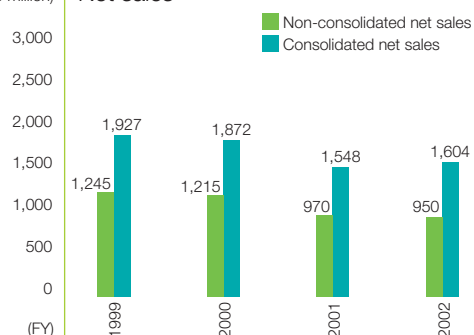
*Products of affiliates

Fiscal 2002 net sales (non-consolidated)



(unit: ¥100 million)

Net sales



Scope of the Environmental Report 2003

Period

Fiscal 2002

(April 1, 2002 to March 31, 2003)

Offices and facilities

Sumitomo Bakelite Co., Ltd.

Amagasaki Plant (and consolidated affiliates on plant grounds)

Shizuoka Plant (and consolidated affiliates on plant grounds)

Utsunomiya Plant

Tsu Plant

Fundamental Research Laboratory

Kobe Fundamental Research Laboratory

Akita Sumitomo Bakelite Co., Ltd.

Artlite Kogyo Co., Ltd.

Tokyo Kakohin Co., Ltd.

Hokkai Taiyo Plastic Co., Ltd.

Yamaroku Kasei Industry Co., Ltd.

Kyushu Bakelite Industry Co., Ltd.

Sumitomo Bakelite Co., Ltd.

Head Office

Tennoz Parkside Building, 2-5-8, Higashi-Shinagawa,
Shinagawa-ku, Tokyo 140-0002

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☎ +81-45-811-1661 FAX: +81-45-812-4898

Kobe Fundamental Research Laboratory

1-1-5, Murotani, Nishi-ku, Kobe, Hyogo 651-2241

☎ +81-78-992-3900 FAX: +81-78-992-3919

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2-3-47, Higashi-Tsukaguchi-cho, Amagasaki, Hyogo 661-8588

☎ +81-6-6429-6941 FAX: +81-6-6427-8055

Nagoya Office

87 Chouda-cho, Meitou-ku, Nagoya, Aichi 465-0027

☎ +81-52-726-8351 FAX: +81-52-726-8396

Amagasaki Plant

2-3-47, Higashi-Tsukaguchi-cho, Amagasaki, Hyogo 661-8588

☎ +81-6-6429-6941 FAX: +81-6-6427-8055

Shizuoka Plant

2100 Takayanagi, Fujieda, Shizuoka 426-0041

☎ +81-54-635-2420 FAX: +81-54-636-0294

Utsunomiya Plant

20-7, Kiyohara Kogyo Danchi, Utsunomiya, Tochigi 321-3231

☎ +81-28-667-6211 FAX: +81-28-667-5519

Tsu Plant

5-7-1, Takachaya, Tsu, Mie 514-819

☎ +81-59-234-2181 FAX: +81-59-234-8728

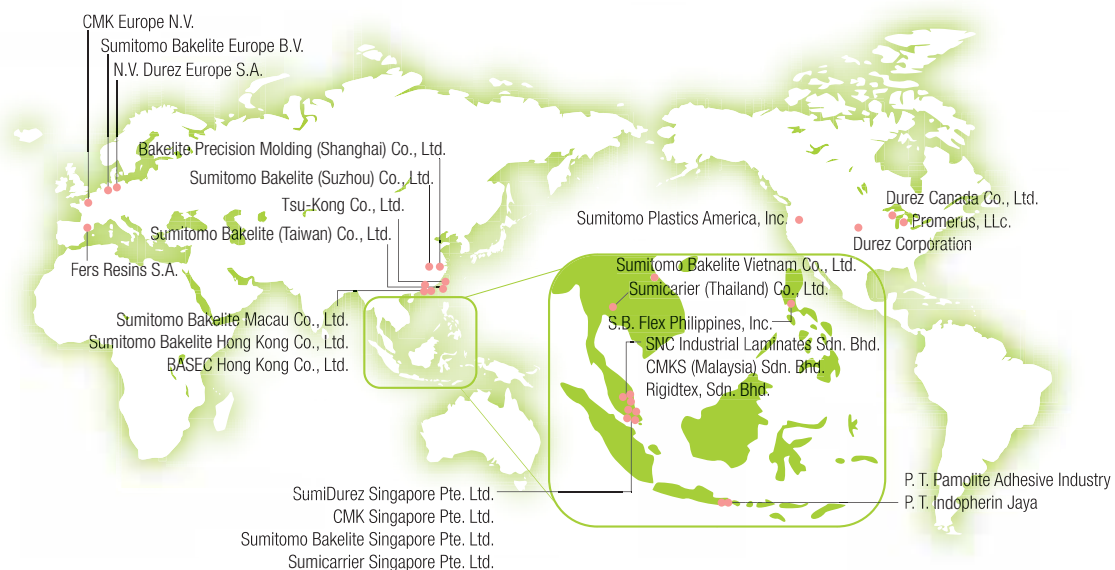
Domestic Affiliates

Akita Sumitomo Bakelite Co., Ltd.
Tsutsunaka Plastic Industry Co., Ltd.
Artlite Industry Co., Ltd.
Tokyo Kakohin Co., Ltd.
Hokkai Taiyo Plastic Co., Ltd.
Nippon Denkai Co., Ltd.
Otomo Chemical Co., Ltd.

Yamaroku Kasei Industry Co., Ltd.
Kyushu Bakelite Industry Co., Ltd.
Japan Communication Accessories
Manufacturing Co., Ltd.
SPD Co., Ltd.
ST Film Sheet Co., Ltd.
Advanced Plastics Compound Company

Sunbake Co., Ltd.
Decolanitto Co., Ltd.
Sumibe Service Co., Ltd.
S.B. Techno-Research Co., Ltd.
S.B. Information System Co., Ltd.
S.B. Recycle Co., Ltd.
SBTEG Co., Ltd.

Overseas Affiliates



SUMITOMO BAKELITE CO., LTD.

Contact: Environment, Safety & Recycling Dept.

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レスポンシブル・ケア



環境にやさしい



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