

Thinking of Future Generations



The harmonization of business activities with humanity and the environment is the most important management priority for the Toyo Group. The growing seriousness of global environmental problems in recent years has heightened the Group's awareness of the environmental implications of its activities. The entire Group is working actively to protect the global environment through initiatives based on a clear vision for the future. We are determined to maximize the benefits of these initiatives by expanding our efforts, and by raising environmental awareness and concern in all facets of the Group's operations.



Company Profile (As of March 31, 2003)

Company name	Toyo Tire & Rubber Co., Ltd.
Head office	17-18, Edobori 1-chome, Nishi-ku, Osaka 550-8661, Japan
Date of establishment	August 1, 1945
President	Yoshio Kataoka
Capital	23,974 million yen
Net sales	Non-consolidated basis ¥200,981 million Consolidated basis ¥255,157 million
No. of employees	Non-consolidated 3,033 Consolidated basis 6,280
Major products	Automotive tires and tubes, industrial rubber and plastic products, polyurethane products, waterproof and shielding sheets, automotive parts, sporting goods, and other related products

Plants

Kuwana Plant (automotive tires, automotive parts, plastic products)
Sendai Plant (automotive tires)
Hyogo Manufacturing Complex (industrial rubber and plastic products, polyurethane products, automotive parts)
Fukushima Plant (industrial rubber products)

Major affiliated manufacturing companies

Fukushima Rubber Co., Ltd. (automotive parts, waterproof and shielding sheets, polyurethane foam)
T.G.K. Co., Ltd. (automotive parts)
Toyo Soflan Co., Ltd. (polyurethane products, automotive parts, plastic products)
Chubu Soflan Co., Ltd. (automotive parts, plastic products)
Ayabe Toyo Rubber Co., Ltd. (polyurethane products, plastic products)

R&D facilities

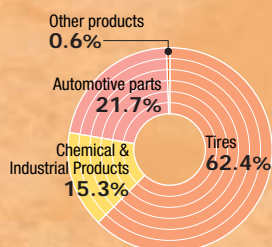
Technical Research Center
Toyo Technical Center
Soflan Technical Center
Automotive Parts Technical Center
High-Polymer Processing Technology Center
Tire Test Course (Tsunoi, Miyazaki)
Winter Tire Test Course (Saroma, Hokkaido)

Overseas Plants

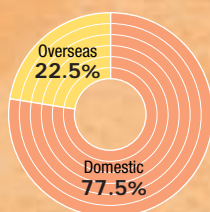
GTY Tire Company (Mt. Vernon, Illinois, U.S.A.)
New Pacific Industry Co., Ltd. (Chuang-Hua, Taiwan)
Toyo Tire & Rubber Australia Limited (Enfield, New South Wales, Australia)
Cheng Shin-Toyo Tire & Rubber (China) Co., Ltd. (Jiangsu Province, China)
Toyo Rubber (Malaysia) SDN.BHD. (Johore Bahru, Malaysia)
Toyo Automotive Parts (U.S.A), Inc. (Franklin, Kentucky, U.S.A.)
Cheng Shin-Petrel Tire (Xiamen) Co., Ltd. (Xiamen, China)

Business Performance Fiscal Year 2002 (Year Ended March 31, 2003)

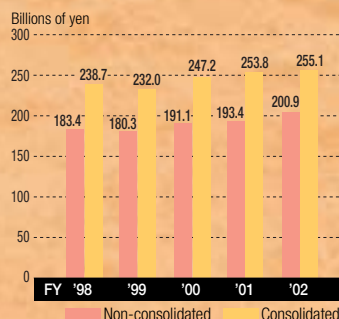
Consolidated Sales in by Business Segment



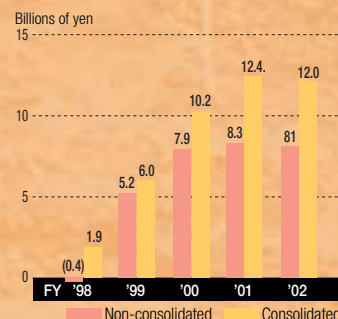
Consolidated Sales in by Market



Sales



Income (loss) before income taxes



● Scope of Report

Period

This report focuses mainly on results and activities for FY2002 (from April 1, 2002 to March 31, 2003).

Organizations Covered

Toyo Tire & Rubber Co., Ltd., Kuwana Plant
Toyo Tire & Rubber Co., Ltd., Sendai Plant
Toyo Tire & Rubber Co., Ltd., Hyogo Manufacturing Complex
Fukushima Rubber Co., Ltd.
T.G.K. Co., Ltd.
Toyo Soflan Co., Ltd.
Chubu Soflan Co., Ltd.
Ayabe Toyo Rubber Co., Ltd.

● Editorial Policy for the Environmental Report 2003

The mission of the Toyo Group is to contribute to society by working to create a more comfortable environment through its products and technology, especially tires, vibration-control and thermal-insulation technology. Through these activities, the Group is also actively striving to reduce environmental loads through initiatives in such areas as the prevention of global warming, the reduction of industrial waste, safe management of chemical substances, the development of environment-friendly technologies, products and business activities, and recycling. Another focus is the promotion of environmental awareness through educational and support programs. As part of this work, the Group has produced annual Environmental Reports each year since 2000. It also discloses information on its web site.

Environmental Report 2003 is the fourth published by the Toyo Group, and its content has been further enhanced and expanded. In compiling the report, the editors referred to the Environment Ministry's Environmental Reporting Guidelines (2000) and Environmental Accounting Guidelines (2002). The Report focuses on priority initiatives by the Toyo Group and on the Group's activities in FY2002.

● Publication Date

August 2003 (The planned release date for next year's report is August 2004.)

● Department Responsible for Publication

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Design Concept for Environmental Report 2003

The Toyo Group regards healthy interaction among people, their communities and the environment as an important aspect of its business activities. This concern is reflected in the wide-ranging environmental initiatives described in Environmental Report 2003. The design concept is expressed through visual content focusing on the Group's commitment to social advancement in harmony with the environment, and to the preservation of clean water, air and land for future generations.

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Toward Sustainable Development and Growth Based on Harmony between Environmental Protection and Economic Advancement.



Yoshio Kataoka
President

Today there is universal awareness of the problems of resource depletion and global warming, and of the need to reconcile environmental conservation with economic development if we are to realize the shared human desire to achieve a high standard of living. The business activities of the Toyo Group are guided by our recognition that the only true business growth is sustainable growth.

“The environment and safety” have been fundamental business priorities for the Toyo Group throughout its history as a manufacturer and supplier of tires, industrial rubber products, polyurethane and plastics, and as a provider of related services. In 1992 we established the “Toyo Global Environmental Charter,” together with a concrete environmental program called the “Toyo Global Environmental Action Plan.” Since 1998 we have been working to achieve ISO 14001 accreditation at our facilities. Through these efforts, we have created a structure for sustainable business activities. Last year we adopted the “21st Century Management Vision” containing three core policies for the future business activities of the Toyo Group. One of those core policies calls for decisive action on global environmental problems as part of our continuing commitment to the creation of corporate value.

Energy utilization and the disposal of industrial waste are important issues for us as manufacturers. We have established specific targets in these two areas, and we are working steadily toward the realization of those targets.

Environmental Report 2003 describes our environmental activities in FY2002. We hope that it will aid your understanding of our efforts, and we look forward to hearing any comments or views concerning its content.

We have established specific targets for the reduction of environmental loads, and we are working steadily toward the achievement of those targets.



Kusuo Ogawa
Chairperson, Environmental
Preservation and Occupational
Health & Safety Committee
Executive Officer



Yukio Komai
Chairperson, Environmental
Preservation Subcommittee
Executive Officer

In April 2003, we were appointed as the new chairpersons of the Environmental Preservation and Occupational Health & Safety Committee and its subsidiary organization, the Environmental Preservation Subcommittee. We are therefore presenting this report on activities in FY2002 on behalf of our predecessors.

Our environmental activities have been based on specific medium-term and long-term goals and yearly targets for each priority area. Our progress toward achievement of targets for specific areas in fiscal 2002 is described on the relevant pages of this report. In terms of our management priorities, we have reduced levels of air and water pollutants by bigger margins than in FY2001. We were also able to reduce our water consumption by around the same amount as in the previous year. Waste volumes were cut by around 10% from the previous year's level, but we failed to reach our target reduction. We also fell short of our targets for energy conservation and the reduction of carbon dioxide emissions. Our failure to reach these targets was primarily attributable to increased tire production.

These results are reflected in our new three-year "Environmental Improvement Plan." We intend to implement this plan decisively as part of our continuing efforts to achieve further reductions in environmental loads.

Medium/Long-Term Goals in Two Key Priority Areas

1. Reduction of carbon dioxide emissions by 10% relative to the 1990 level by the end of 2010
2. Achievement of zero emissions at all production sites by the end of FY2005

The entire Toyo Group will work decisively toward the realization of these two goals.

We also plan to strengthen our organizational structures and enhance corporate activities in this area by establishing a new specialist committee, and by seeking the participation of labor unions. Other actions to achieve further reductions in environmental loads include the reinforcement of the corporate audit systems to ensure total compliance by all Toyo Group companies.

As with previous Environmental Reports, Environmental Report 2003 will be published on the Internet as well as in paper form. We hope it will contribute to wider understanding of the environmental initiatives of the Toyo Group.

Environmental Management

Environmental management is a management approach guided by a strong awareness of environmental priorities, including protection of the global environment and the reduction of environmental loads. The Toyo Group has established environmental management systems based on ISO 14001, the international standard for environmental management systems. The entire Group is implementing environmental initiatives under the Toyo Global Environmental Charter and the Toyo Global Environmental Action Plan.

Toyo Global Environmental Charter

1. Basic Philosophy

Our corporate activities are aimed at enhancing the quality, enjoyment and dynamism of life. Through those activities, we are helping to protect the Earth and build a more affluent and fulfilling society.

2. Action Guidelines

1) Compliance with laws and regulations ▶

We will work to protect the environment by complying with environmental laws and regulations.

2) Reducing environmental impact ▶

We will strive to reduce environmental impact by limiting waste and conserving energy in our business operations, and by minimizing the use of harmful chemical substances. We will also work to protect and effectively utilize resources through recycling and other approaches.

3) Developing environment-friendly products ▶

We will work to develop Earth-friendly products and technologies by considering all phases of the product life cycle, from production to disposal, at the product planning stage. We will develop and supply products and services that contribute to the protection of the global environment, including energy conservation and pollution prevention.

4) Coexistence with society ▶

As a member of the global community and local communities, we will work to build a better living environment through the use of the Toyo Environmental Protection Fund, and through dialog with all segments of society.

5) Corporate education and public information activities ▶

We will implement a full range of clearly defined environmental educational and information activities for employees at all levels. We will also work to inform our customers, society and local residents through public information activities.

6) Implementing environmental activities overseas ▶

At our overseas business sites, we will comply with local environmental laws, implement environmental management systems, and work to achieve harmony with local communities.

7) Emergency countermeasures ▶

We will implement thorough preventive measures against environmental accidents, and we will work to improve equipment and facilities. We will immediately investigate any accidents and implement countermeasures. We will also take steps to prevent recurrences.

3. Improving Management Systems ▶

We will improve our environmental management systems by appointing environmental, safety and health executives and establishing organizational units. We will work to improve the environment through clearly defined action plans formulated by the departments responsible for the implementation of environmental measures. We will conduct annual audits to ascertain and assess the outcomes of our environmental protection activities. Measures will be implemented on the basis of those results.

Toyo Global Environmental Action Plan

Relation to the Toyo Global Environmental Charter		Medium- and Long-term Objectives	Relevant Pages
▶ 2.1) Compliance with laws and regulations		We will work to protect the environment by complying with environmental laws and regulations (including industrial behavior standards, agreements with official agencies, and non-regulatory guidelines) and other requirements, and by maintaining cooperative relationships with local residents.	8
	▶ 2.2) Reducing environmental impact	Prevention of global warming	We will work to reduce CO ₂ emissions by 10% relative to the 1990 level. (Note 1)
We will increase utilization of heat produced from used tires, primarily as fuel for cogeneration systems.			25, 33
Reduction of waste		We aim to reduce direct disposal at landfill sites in FY2005 to no more than 1% of total waste volumes. (Note 2)	20
		We will work to reduce the amount of industrial waste produced.	20
		We will work to improve recycling efficiency and increase on-site disposal rates.	20
Reduction of harmful chemical substances		We will work to eliminate the use of dichloromethane through the development of new technology. (Note 3).	18
Ozone layer protection		We will target the total elimination of chlorofluorocarbon substitutes (HCFC) in 2003.	16
Green procurement	We will preferentially procure environment-friendly materials, and development of related technologies (Note 4).	14	
▶ 2.3) Developing environment-friendly products	Environmental consideration at development stage	We will work at the development stage to minimize environmental loads through the siting of facilities, and through measures relating to the production, distribution, use and disposal of products.	12, 13
		We will carry out life cycle analyses of key products and development of environment-friendly products that are eligible for environmental labeling.	30
	Development and supply of environment-friendly products and technologies	We will develop lightweight, fuel-efficient, low-noise tires.	22
		We will develop and supply energy-saving products, including thermal insulation products for industrial, energy-related and housing use.	23
	Development and supply of environmental protection products, technologies and services	We will develop river cleaning technology and supply rainwater storage and filtration systems. (Note 5).	23
		Supply of pollution prevention products, technologies and services, including stack gas desulfurizers.	—
	Development of recycled products and related technologies	We will develop recycled products made from used tires.	24, 25
We will develop polyol recycling methods and other technologies and products based on those technologies.		24, 25	
▶ 2.4) Coexistence with society	Toyo Environmental Protection Fund (established August 1992)	We will contribute to society through financial support to non-governmental organizations working to solve environmental problems, using funds provided by employee donations matched by corporate gifts (launched in September 1993).	27, 28
	Interaction with local communities	We will participate in and support community events, such as cultural activities and clean-up programs.	29
		We will host factory visits and other events.	30
		We will support employees' voluntary social activities.	—
▶ 2.5) Corporate education and public information activities		We will implement employee awareness activities based on environmental reports, in-house newsletters, information pamphlets and other materials, and public information activities targeting customers and the public.	30
		We will implement employee education and training specifically geared to employee positions and tasks.	6
▶ 2.6) Implementing environmental activities overseas	Management systems	We will thoroughly monitor and comply with local laws and regulations and other requirements.	—
		We will share information, cooperate and act on a global scale.	—
▶ 2.7) Emergency countermeasures	Prevention of environmental accidents through in-depth management	We will ensure proper management of environmental protection facilities, and measurement and management of pollution loads.	19
		We will implement proper education and management in relation to hazardous and toxic substances	18
	Revision and improvement of emergency response manuals	We will carry out emergency response drills	31
▶ 3. Improving management systems	Management systems	Environmental Preservation and Occupational Health & Safety Committee (restructured in June 1997) • Formulation of corporate policies concerning the environment and occupational health and safety	6, 31
		Management Control Center, Environmental Preservation and Occupational Health & Safety Group (restructured in April 2003) • Promotion of environmental protection and occupational health and safety at corporate level	6, 31
	Plants	• Formulation and implementation of specific action plans based on this plan • Operations based on ISO 14001	7
	Environmental accounting	Implementation of environmental accounting based on the Environment Ministry's Environmental Accounting Guidelines (Note 6)	9
	Environmental auditing	Internal and external audits	6

(Note 1) Until the end of FY2001, targets and results were based on amounts per unit of production value. Since FY2002, targets and results have been expressed in tons of product volumes, in accordance with the Environment Ministry's Environmental Reporting Guidelines.

(Note 2) The medium- long-term targets for FY2002 and thereafter have been changed.

(Note 3), (Note 4) Added as medium- long-term targets for FY2002 and thereafter

(Note 5) Added in FY2003

(Note 6) Added in FY2002

Continuing Improvement in Environmental Protection Activities—Environmental Auditing

The Toyo Group conducts annual audits of all of its production sites in Japan to ensure the continuing implementation of environmental protection activities. These audits include external environmental audits by organizations certified under the ISO 14001 standard*, as well as corporate audits. The audit results are reported to the Environmental Preservation Subcommittee. Where possible, improvements are made immediately. For other issues, we aim to take remedial action within three months.

The audits focus on ISO 14001 requirements, especially objectives and targets, progress on remedial action, compliance, communications, monitoring and measurement, and facilities subject to regulation under environmental laws. The aim is to prevent non-compliance and accelerate improvement.

The main priorities identified in the FY2002 audit were the acceleration of efforts to achieve zero emission status, man-

agement of water-related environmental loads by bringing the target date for the fifth total emission reduction program forward by one year, and the acceleration of measures relating to external communications.

The Toyo Group's Environmental Preservation Activities

- Confirmation that environmental management policy aims have been achieved
- Review

- Corporate audits
- External audits
- Environmental accounting
- Calculation of total environmental impact



Implementation Structure

The Toyo Group's efforts to overcome environmental problems began with the establishment of the Environmental Preservation and Occupational Health & Safety Committee in 1972. Since then, the Group has actively and continually expanded its activities, especially in the areas of environmental protection, health and safety, and accident preven-

tion. In 2002, the effectiveness of initiatives in these areas was further enhanced through the separation of the voluntary audit functions of the Environmental Preservation Subcommittee and the Occupational Health and Safety/Disaster Prevention Subcommittee.

Corporate Environmental Preservation, Occupational Health & Safety and Accident Prevention Organization



Environmental Education

Environment-conscious business activities depend on environmental education at all levels, from top management to rank-and-file employees. The Toyo Group recognizes the importance of education and has developed its own unique programs designed to raise the environmental awareness of individual employees. Environmental education for execu-

tives is provided at regular executive forums. Other programs include environmental education for management staff, general employees and new employees, training for internal auditors, and environment-related seminars and workshops. There are also opportunities for participation in external seminars and other programs.



Environmental education at an executive forum



Environmental education for management staff



Environmental education for new employees

* ISO 14001 This international standard for environmental management systems was adopted in 1996 by the International Organization for Standardization (ISO). The standard calls for continual improvement through a management cycle expressed in the words "plan," "do," "check," "act."

ISO 14001 Accreditation

The Toyo Group sees the introduction of systems based on the ISO 14001 standard as an effective basis for voluntary efforts targeted toward continual environmental improvement. In June 1998 the Sendai Plant and Hyogo Manufacturing Complex were the first sites to achieve ISO

14001 accreditation. The accreditation of Fukushima Rubber and T.G.K. in February 2000 completed the introduction of ISO 14001 systems at all eight manufacturing sites in Japan

No.	Name of Site	Location	Accreditation Date	Renewal Date
1	Toyo Tire & Rubber Co., Ltd. Hyogo Manufacturing Complex • Akashi Plant • Hyogo Plant	1183, Rokubuichi, Inamicho, Kako-gun, Hyogo Prefecture 1176, Rokubuichi, Inamicho, Kako-gun, Hyogo Prefecture	June 1998	June 2001
		Scope of registration Environmental management systems that promote improvements in the following areas in relation to the development, design and manufacture of rubber, polyurethane and resin products for general industrial and automotive uses, and replacement services for rubber lining equipment: 1. Resource conservation 2. Energy conservation (reduction of CO ₂ emissions) 3. Waste reduction and recycling 4. Introduction of alternatives to ozone-depleting and environmentally harmful substances 5. Prevention of water pollution 6. Contribution to local communities (including the Toyo Environmental Protection Fund and other programs)		
2	Toyo Tire & Rubber Co., Ltd. Hyogo Manufacturing Complex • Sendai Plant	3-5-1 Fukiage, Iwanuma City, Miyagi Prefecture	June 1998	August 2001
		Scope of registration Environmental management systems that promote improvements in the following areas in relation to the manufacture and shipment of automotive and industrial vehicle tires, the development of lightweight fuel-efficient tires for passenger cars and the disposal of used tires: 1. Reduction of passenger car tire weights 2. Reduction of industrial waste 3. Recycling of waste 4. Energy and resource conservation		
3	Toyo Soflan Co., Ltd. (including Sekisui Soflan Industry, Co., Ltd.)	982, Kaneda, Atsugi City, Kanagawa Prefecture	March 1999	July 2002
		Scope of registration Environmental management systems that promote improvements in the following areas in relation to the manufacture of concentrated liquid for polyurethane foam, the development and manufacture of automotive seat pads, and the design, development and manufacture of general cushion pads, polyurethane blocks, and products made from recycled waste polyurethane foam: 1. Efficient resource and energy utilization 2. Reducing the use of environmental contaminants 3. Reducing the environmental load caused by wastewater 4. Reducing the atmospheric environmental load 5. Designing products with reduced environmental loads 6. Reducing and recycling waste 7. Promoting Environmental Protection Fund activities		
4	Ayabe Toyo Rubber Co., Ltd.	115, Sawa, Kuricho, Ayabe City, Kyoto Prefecture	June 1999	June 2002
		Scope of registration Environmental management systems that promote improvements in the following areas in relation to the development and manufacture of plastic products, and the manufacture of polyurethane-related products: 1. Resource conservation 2. Energy conservation (reduction of) 3. Reduction and recycling of industrial waste 4. Reducing the use of substances that impose environmental loads (e.g. dichloromethane) 5. Contributing to local communities (e.g. Toyo Environmental Protection Fund activities)		
5	Chubu Soflan Co., Ltd. (including the Automotive Parts Technical Dept NO. 2 of Toyo Tire & Rubber Co., Ltd.)	3, Aza Shogayama, Oaza, Uchikoshi, Miyosicho, Nishikamogun, Aichi Prefecture	September 1999	August 2002
		Scope of registration Environmental management systems that promote improvements in the following areas in relation to the manufacture of polyurethane foam products for automotive and general industrial uses, the assembly and manufacture of automotive safety devices (air bags), molding and coating of resin bumpers for automotive uses, the development of Eco Foam, and the collection and reuse of waste polyurethane foam: 1. Reduction of CO ₂ 2. Reduction of dichloromethane use 3. Reduction and reuse of industrial waste 4. Promoting Environmental Protection Fund activities		
6	Toyo Tire & Rubber Co., Ltd. Kuwana Plant	2400, Oaza Nakagami, Toincho, Inabe-gun, Mie Prefecture	December 1999	January 2003
		Scope of registration Environmental management systems that promote improvements in the following areas in relation to the manufacture of automotive tires, industrial vehicle tires, construction vehicle tires, retread tires for aircraft, and automotive parts (e.g. rubber vibration dampers): 1. Energy conservation 2. Resource conservation 3. Reduction and recycling of industrial waste 4. Reduction of organic solvent use 5. Support activities for regional environmental protection organizations		
7	Fukushima Rubber Co., Ltd. (including the Fukushima Plant of Toyo Tire & Rubber Co. Ltd., F.C.C. Co., Ltd., and the High-Polymer Processing Technology Center of Toyo Tire & Rubber Co. Ltd.)	28, Aza Domaie, Miyashiro, Fukushima City, Fukushima Prefecture	February 2000	February 2003
		Scope of registration Environmental management systems that promote improvements in the following areas in relation to the development and manufacture of rubber products for general industrial and automotive uses, the development and manufacture of polyurethane and resin products for general industrial uses, and the manufacture and servicing of automotive safety devices (air bags): 1. Contribution to local and global environmental protection through the Toyo Environmental Protection Fund 2. Energy conservation (electric power, fuel oil), and reducing the use of harmful substances (e.g. dichloromethane, CFC substitutes) 3. Reduction and recycling of industrial waste (e.g. waste rubber and plastic) 4. Development of products that reduce environmental loads		
8	T.G.K. Co., Ltd.	52-1, Furumaya, Sekicho, Suzukagun, Mie Prefecture	February 2000	February 2003
		Scope of registration Environmental management systems that promote improvements in the following areas in relation to the manufacture of automotive rubber products, anti-vibration rubber, weather strips and other products: 1. Energy conservation (reducing electric power consumption) 2. Reducing the use of substances that impose environment loads (e.g. toluene, xylene) 3. Reduction and recycling of industrial waste 4. Resource conservation (effective use of water resources)		

Managing Environmentally Hazardous Substances in Accordance with Laws and Regulations

Plants and major manufacturing subsidiaries in the Toyo Group manage environmentally hazardous substances appropriately and in strict compliance with laws, ordinances and other requirements. The Group is strongly committed to the prevention of environmental pollution, including air, water and soil contamination, resulting from its business operations. We are working at the most fundamental levels, including product design and manufacturing processes, to eliminate or reduce the use of environmentally hazardous substances. We are also implementing all possible counter-measures against environmental risks, including precautions

against natural disasters, facility breakdowns, accidents, and other contingencies.

Compliance with Related Laws and Other Requirements

Laws, etc. (Environment-Related)	Compliance in FY2002	Remarks
Air Pollution Control Law	Full compliance with required standards at all sites	
Water Pollution Control Law	Full compliance with required standards at all sites	
Law Concerning Special Measures for Promoting Appropriate Disposal of Waste Containing Polychlorinated Biphenyl	Appropriate storage and management of approximately 2,070 items of equipment in which PCB substances are used	Details in next section

Management of PCB*Containing Equipment¹

The Law Concerning Special Measures for Promoting Appropriate Disposal of Waste Containing Polychlorinated Biphenyl (PCB) took effect in July 2001. Requirements under this law include mandatory annual reports to prefectural governors concerning the use and storage of condensers, transformers and other equipment which contains PCBs. The Toyo Group aims to eliminate all such equipment by the end of FY2005. The Group will use disposal methods

that render PCB substances harmless, while monitoring developments relating to PCB disposal facilities.

Storage and Use of PCB-Containing Equipment

	Stored/In Use
Condensers (high-pressure, low-pressure) Transformers (single-phase, low-voltage)	Approx. 170
Fluorescent lighting ballasts	Approx. 1,900

Penalties, Incidents and Complaints, and Responses

Prompt Response to Outside Complaints

No legal penalties were incurred in relation to business operations in FY2002. There were no accidents, but seven outside complaints were received. We always respond promptly to

accidents and complaints, and inspection procedures at the sites concerned are strengthened to prevent recurrences.

Outside Complaints and Responses

Complaint		Response
Water pollution	Oil film observed on wastewater from plant	<ul style="list-style-type: none"> Local residents were informed about the situation and response measures. The problem was caused by the concentration of oil-water separation processing in one of two separation tanks because of capacity expansion work on the other. It was solved by the completion of the capacity expansion work. (Analysis confirmed that the level of n-hexane (mineral oil) did not exceed the legal standard.)
Odors	Odor emitted during rubber/metal separation	<ul style="list-style-type: none"> A new deodorization system was installed to prevent odors from emanating.
Noise	Loud noise from machinery	<ul style="list-style-type: none"> The noise level was below the level stated in regulations, but the complaint was resolved through further noise prevention measures.
	Noise from short-term demolition work Factory public address system too loud at night	<ul style="list-style-type: none"> The noise was temporary, and the problem has been resolved. The problem was resolved by adjusting the volume.
Air pollution	Black smoke emitted from smokestacks	<ul style="list-style-type: none"> The problem occurred when a diesel generator ran out of fuel. It was resolved through the replacement of parts.
Miscellaneous	Complaint from convenience store near plant about customers with muddy shoes	<ul style="list-style-type: none"> The problem was caused by people working for a subcontractor. They were informed about the need for care in relation to the issue.

Situation Following Action in Response to Water Contamination Problem



No. 1 Oil-Water Separation Tank after completion of upgrade



No. 2 Oil-Water Separation Tank after completion of upgrade

* PCB Poly Chlorinated Biphenyl (PCB) was once used for a wide range of applications, including insulating oils and lubricants. Production was terminated in 1972.

Environmental Accounting for Environmental Management

The harmonization of business activities with humanity, nature and technology is vital to the maintenance of long-term business growth. Proper monitoring of the costs and benefits of environmental protection activities and measures is also important. The information gained is applied to future environmental management policies and used to inform stakeholders through disclosure activities. Awareness of these factors led the Toyo Group to introduce an environmental accounting system in 1999.

The environment accounting system employed in FY2002 is based on the Environment Ministry's Environmental

Reporting Guidelines (2002). The system covers all plants and sites, including those operated by major manufacturing affiliates. Where economic benefits from environmental measures can be accurately quantified, these are shown in the accounts. Economic benefits in FY2002 amounted to ¥758 million, a decline of ¥229 million from the previous year's level. Investment in environmental protection measures increased by ¥125 million to ¥245 million, but costs were reduced by ¥82 million to ¥1,666 million. We will continue to target improvements in both the environmental and economic benefits of our environmental protection measures.

Benefits

■ Environmental Benefits

Item	Indicator Category		Result for FY 2002	Decrease
Environmental benefits relating to resources used in business activities	Water consumption	Water consumption (thousands of m ³)	3,521	-58
Environmental benefits relating to environmental loads and waste resulting from business activities	Atmospheric emissions	CO ₂ (tons- CO ₂)	288,099	-16,487
		SO _x emissions (tons)	596	48
		NO _x emissions (tons)	1,245	1
	Emissions into bodies of water	BOD (tons)	14	3
		COD* (tons)	19	2
Waste emissions	Direct disposal at landfill sites (tons)	4,542	491	
Environmental benefits resulting from goods and services produced through business activities	Collection of products	Used tires collected (tons)	13,336	-603

Note: A negative (-) figure indicates an increase from the previous year's level.

■ Economic Benefits from Environmental Protection Measures

Category (Substantial Benefit)		Amount of Benefit
Income	Income from recycling of waste produced through core business operations, and recycling of used products, etc.	11.4
Cost reduction	Reduction of energy costs through energy conservation	688.1
	Reduction of waste disposal costs through resource conservation and recycling	58.1
TOTAL		757.6

(millions of yen)

Costs

■ Expenditures on Environmental Protection Measures

Cost Item	Main Areas of Expenditure	Investment	Costs	
On-site costs	Pollution prevention costs	Maintenance of facilities (desulfurization systems, waste water treatment tanks, etc.), pollution load charges	153.7	234.1
	Global environmental protection costs	Maintenance of facilities (cogeneration systems, on-site generators, etc.)	34.0	337.6
	Resource recycling costs	Industrial waste treatment, disposal and recycling	23.2	471.3
Upstream/downstream costs	Recycling of used tires and polyurethane waste as new products	0	98.7	
Management costs	Environmental improvement in areas around plants	3.8	209.8	
R&D costs	R&D relating to non-CFC foaming technologies and next-generation CFCs	30.6	308.8	
Social activity costs	Toyo Environmental Protection Fund grants	0	5.2	
Environmental damage costs		0	0.0	
TOTAL		245.3	1,665.5	

(millions of yen)

Key basic items calculated for environmental accounting

1. Calculation criteria for environmental protection benefits

Calculation method: The previous year is used as the base period. Changes in environmental loads are calculated relative to that base period.

2. Calculation criteria for economic benefits from environmental protection measures

(1) Scope of benefits

• Only real benefits are considered. Investment benefits are considered to be valid over the period while environmental protection facilities are in operation.

(2) Calculation method for economic benefits

(a) Income: This is income recorded in the financial statements as having been earned

in the current accounting period as a result of environmental protection activities.

(b) Cost reductions: These are costs deemed to have been saved in the current accounting period as result of environmental protection activities.

3. Calculation criteria for environmental protection costs

(1) Calculation method for depreciation: Depreciation of investments is included in costs.

(2) Accounting criteria for composite costs: Cost differences are totaled proportionately according to reasonable criteria and calculated in order of priority for proportionate totaling.

★ **Environmental accounting** is a system designed to identify the costs and benefits of environmental protection activities in the context of business operations as quantitatively as possible. The aim is to allow businesses and other organizations to achieve sustainable development, maintain good relationships with society, and implement environmental protection initiatives efficiently and effectively.

★ **Chemical Oxygen Demand (COD)** is an indicator of the quantity of oxygen required for the chemical oxidization and stabilization of contaminants in water. Its value increases in proportion to the pollution level of water.

Reducing Environmental Loads

The most important priorities for our business activities are to contribute to society by supplying superior products and services, and to protect nature as an irreplaceable legacy for all mankind. We love the Earth and want it to remain a place where people can enjoy enriching and healthy lives. That is why our activities are constantly guided by our awareness of what we can today for the generations of tomorrow.

Considering the future
of our water, air and soil

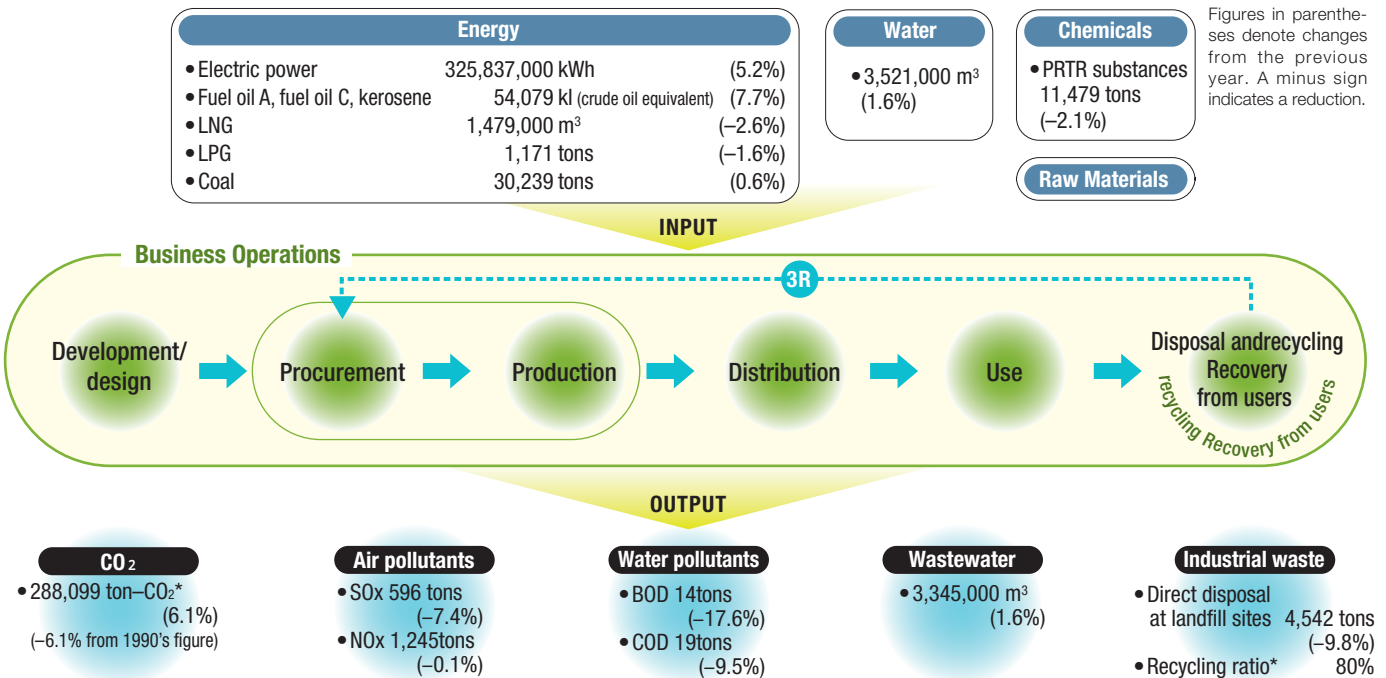
The Environmental Impact of the Toyo Group

Environmental Loads from Business Operations

The Toyo Group imposes loads on the environment through its business activities by using resources and energy to manufacture products. Environmental loads for the entire

Group are published to clarify the relationship between its business operations and environmental loads

Environmental Loads in FY2002



Figures in parentheses denote changes from the previous year. A minus sign indicates a reduction.

*Calculated using the calculation method recommended by the Keidanren (Japan Federation of Economic Organizations);

*Recycling ratio = $\frac{\text{Volume recycled internally and externally}}{\text{Total production volume}} \times 100$

TOPICS

Recycling Technology Using Super-Critical Carbon Dioxide (Developed at Technical Research Center)

1. Supercritical carbon dioxide is obtained under the temperature and pressure conditions shown in the diagram. It has the following characteristics.

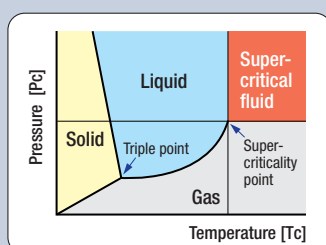
- The conditions required for supercriticality are eased.
- Because of its high diffusion coefficient, it penetrates rubber and polyurethane more rapidly than organic solvents.
- Because carbon dioxide is a gas under normal temperature and pressure conditions, it is easy to remove after the completion of reactions.
- Because carbon dioxide is an inert gas, it is suitable for fire prevention and other applications.

2. Rubber Recycling Applications

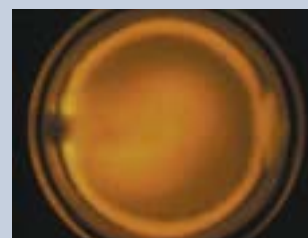
Test results show that when substances formed using supercritical carbon dioxide as a solvent are reused as part of new rubber, the resulting rubber vulcanizates have better physical properties than recycled rubber produced using conventional recycling methods.

3. Polyurethane Recycling Applications

When super-critical carbon dioxide was used as a hydrogenation solvent, a high conversion rate was achieved for low molecular weight oil substances. This research was conducted jointly with Professor Sekine of the Department of Science and Engineering, Waseda University.



Phase Diagram for Carbon Dioxide



Supercriticality

Development and Design of Environment-Friendly Products

Tires

Tires that Help the Global Environment

Each time a vehicle is driven, it emits the greenhouse gas carbon dioxide (CO₂) through the combustion of gasoline or diesel. To reduce the amount of CO₂ emitted, it is necessary to improve fuel efficiency so that less gasoline or diesel is used. One way to enhance fuel efficiency is to reduce the rolling resistance of tires. Improvements in this factor ultimately lead to reductions in the amount of CO₂ emitted.

By introducing new technologies affecting tire characteristics, such as shape, structure and rubber composition, the Toyo Group has reduced rolling resistance between approximately 20% over the past decade. In addition, the weight of

tires has been lowered by around 10% over the same period, while tire longevity has improved by 20%. These improvements are contributing indirectly to the reduction of CO₂ emissions.

The global environment has become a key consideration for the development of new motor vehicles, such as hybrid and battery cars. The Toyo Group is working in step with these efforts by focusing its research and development activities on the creation of tires that will contribute to even better fuel efficiency and weight reductions.

T mode—Basic Technology for Advanced Tire Design

In addition to improvements in basic performance characteristics, such as reduced rolling resistance and noise and extended tire life, tire users today are also demanding better driving performance, especially in such areas as shorter braking distance, excellent aquaplaning and superb cornering grip. The only way to reconcile these conflicting performance demands is to develop technologies that allow tires to be designed for specific vehicle types and purposes, based on precise measurement of tire loads and other factors, and the optimization of structural and material designs. The Toyo Group applied these concepts to the development of basic technology infrastructure for tire development. The result

was the T mode system, which employs integrated simulations to analyze the behavior of both vehicles and tires during driving. This approach has been applied to the development of all passenger car tires since the TRAMPIO Vimode, which went on sale in January 2001 as a specialized response-oriented sport tire. The resulting products combine superb basic performance characteristics with excellent driving performance.

The T mode system is used to simulate the behavior of vehicles and tires during driving.

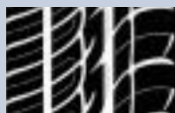


Key Features of the TRANPATH MP3

The TRANPATH MP3 embodies all of the technical expertise of the Toyo Group. Created specifically for use in minivans, it was developed using the Group's exclusive T mode design technology.

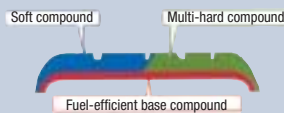
Assymetric Tread Patterns

Minivans are both tall and heavy. As a result, loads differ between the inner and outer sides of the tires. The use of high-rigidity blocks on the outer side, which bears a heavier load, improves driving performance, while slits and sipes on the inner side reduce noise and ensure enhanced passenger comfort.



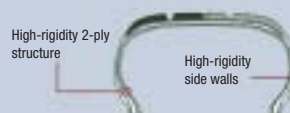
Three-component Tread

The TRANPATH MP Plus, which preceded the MP3, provided support for all types of driving, by adding a highly acclaimed twin grip compound tread with asymmetric inner and outer patterns, to a fuel-efficient base. The aims of this design were to increase resistance to uneven wear and improve fuel efficiency.



High-Rigidity Case

The use of a high-rigidity 2-ply structure has increased strength by a factor of 1.3 compared with the previous model. This is reflected in improved steering stability at high speeds. The improved rigidity of the side walls ensures that cornering and lane changes are completed smoothly and exactly as the driver intended.



TRANPATH MP3

Increased Emphasis on Development of Studless Tires

In 1990, Japan introduced a new law to prevent dust pollution caused by spiked winter tires. In compliance with this law, the Toyo Group has since worked to reduce road dust by selling studless tires. To increase the pace of performance improvement and development, an ice drum tester was installed in 2001 to allow studless tires to be tested reliably throughout the year.



Ice drum tester



The GARIT G30

■ Chemical and Industrial Products

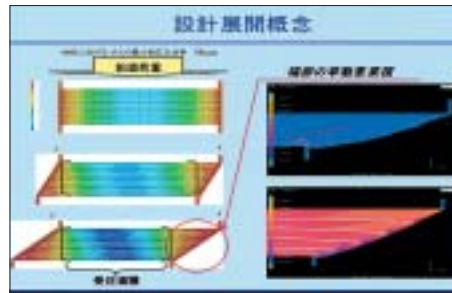
Reducing Vibration—High-damping seismic rubber bearing and seismic isolation rubber bearing

The 1995 Kobe Earthquake focused public attention on the need for improved earthquake resistance in buildings and structures. As a rubber manufacturer, the Toyo Group produces systems made from natural rubber (NR), high-damping rubber (HDR, HDR-S), spring-locked lead-enclosed rubber (SPR), and chloroprene rubber (CR). We regard the high-damping seismic rubber bearing and seismic isolation rubber bearing as core product categories in the area of chemical industrial products, and we are continually striving to develop and design highly reliable products that will meet user needs and contribute to society.

For example, our rubber bearings for bridges are mostly based on laminated rubber structures. These effectively disperse horizontal forces and provide excellent seismic isolation performance. By dispersing horizontal forces, rubber bearings provide flexible support for bridge superstructures. Laminated rubber improves the seismic performance of bridges by providing seismic isolation and dispersing horizontal forces into the piers. Moreover, the ability to disperse horizontal forces across all of the piers allows bridges to be built with longer spans. The reduction in the number of joints in bridges alleviates the vibration and noise caused as vehicles cross joints.



Rubber bearings enhance the earthquake resistance of bridges.



Example of forecasting based FEM analysis



Large-scale horizontal rigidity testing system



Evaluation using the large-scale horizontal rigidity testing system

■ Automotive Parts

Reducing the Use of Chemical Substances in Paints and Adhesives

From the development stage onwards, the Toyo Group carefully controls the use of chemical substances in anti-vibration rubber, seat cushions and other automotive parts, because of the potential effects on human health or ecosystems. Products are designed and developed to minimize the use of substances that cause environmental loads. Particular priority has been given to the reduction of the use of lead and lead compounds in antirust paint and adhesives,

and the use of chromium-6 as a zinc galvanizing chromate. In FY2002, the Toyo Group completed the shift to totally lead-free products in place of adhesives containing lead in rubber vibration dampers anti-vibration rubber. This was achieved without any reduction in product functionality. We aim to phase out the use of lead paints by July 2004 and chromium-6 by July 2006.



Development and design



Lead-free anti-vibration rubber

Green Procurement

Medium/Long-Term Goals

Action Plan

1. To encourage suppliers to achieve external certification under the ISO14001 system
2. To reduce or replace substances designated for monitoring by Toyo Tire & Rubber

Expanding Procurement of Environment-Friendly Supplies

The Toyo Group has been working to increase green procurement of non-manufacturing supplies in accordance with the Law on Promoting Green Purchasing, which took effect in 2001. In FY2002, the Group also began to focus on green procurement of manufacturing supplies. The criteria for the selection of suppliers were expanded to include the environment (E), as well as quality (Q), cost (C) and delivery date (D). The following two measures were implemented to support this change.

1. Monitoring of suppliers' progress toward ISO14001 accreditation and the establishment of environment management systems (EMS)
2. Monitoring to ascertain whether or not products include substances designated by the Toyo Group
 To date 76% of suppliers have achieved accreditation under the ISO14001 system. As far as the second requirement is concerned, investigations were carried out concerning eight of the 147 monitored substances. The eight substances included toluene used in mold release agents and tetrachloroethylene used in adhesives. We will continue to work toward our medium/long-term goals by implementing progressive programs based on these two measures.

Automotive Tire Retreading

In April 2002, the use of retreaded tires was added to obligations under the Law on Promoting Green Purchasing. The Toyo Group has actively expanded its tire retreading operations in response to this measure. Tire retreading involves the application of a new rubber surface to the casing of a worn-out automotive tire that has reached the end of its first service life, allowing it to be used for a second life. There are two processing methods: remolding and precuring.



Inspecting a tire casing

Using Natural Gas Vehicles for the Corporate Fleet

Nitrous oxides (NOx) and particulate matter (PM) are responsible for increased air pollution caused by vehicle exhaust gases. To reduce these environmental loads, the Toyo Group uses natural gas vehicles in its fleet of delivery vehicles. Natural gas is a clean fuel with lower NOx and CO2 emissions than gasoline. There is growing interest in natural gas as a people-friendly and environment-friendly fuel for low-pollution motor vehicles.



A natural gas vehicle

Preventing Global Warming

Action Plan

Medium/Long-Term Goal

Reduction of carbon dioxide emissions by 10% from 1990 level by the end of FY2010

Target Levels and Results for FY2002

Target level: 283,691 tons CO₂
Actual level: 288,099 tons CO₂
Achievement ratio: 98.5%

Target for FY2003

CO₂ emissions
289,141 tons CO₂

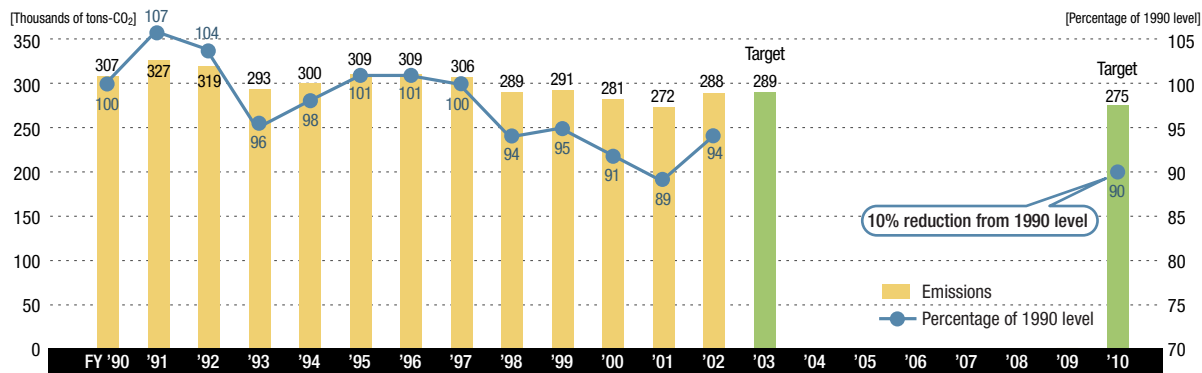
Reducing Carbon Dioxide Emissions

The 1997 Kyoto Protocol calls for the reduction of carbon dioxide emissions by 6% relative to 1990 levels. Japan is implementing specific measures to achieve this goal, and further reductions are being targeted under a new master plan for global warming prevention efforts. In line with these policies, the Toyo Group is working continuously to prevent global warming by reducing its emissions of carbon dioxide.

Tire manufacturing plants use large quantities of electric power and fuel, leading to substantial emissions of carbon dioxide. However, emission levels are being reduced through a range of measures, including energy conversion, the installation of cogeneration*systems and energy conser-

vation equipment, and the improvement and modification of plant facilities to minimize energy losses. Energy is also being saved through improvements to the efficiency of production methods. Energy conservation initiatives at individual manufacturing sites include energy management, conversion to fuels with low carbon dioxide emissions, and efforts to raise employee awareness about energy conservation. Also, employees are encouraged to save electricity and to stop the engines of on-site vehicles whenever they are stationary. Benefits from these group-wide efforts include reduced electric power consumption.

Carbon Dioxide Emissions



*CO₂ emissions were calculated using the calculation method recommended by the Keidanren (Japan Federation of Economic Organizations).

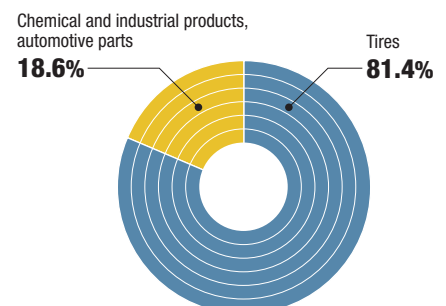
Energy Utilization and Carbon Dioxide Emissions by Business Segment

Overall energy consumption statistics for FY2002 are shown on Page 11. As shown below, there was a year-on-year increase in the tire segment's consumption of energy from all sources. In the areas of chemical and industrial products and automotive parts, there were increases in consumption of fuel oil and electric power, though gas consumption decreased.

The tire segment accounts for approximately 80% of energy consumption. Medium/long-term priorities for this segment include energy conversion and the installation of more cogeneration systems.

- Tires
- Electric power: 6.8% increase
 - Fuel oil A, fuel oil C, kerosene: 8.1% increase
 - Coal: 0.6% increase
- Chemical and industrial products, automotive parts
- Electric power: 7.1% increase
 - Fuel oil A, fuel oil C, kerosene: 7.1% increase
 - LNG: 2.6% reduction
 - LPG: 1.6% reduction

CO₂ Emissions by Segment in FY2002



*Cogeneration systems produce heat and electric power simultaneously. Because these systems utilize waste heat while generating electric power, their thermal efficiency is higher than stand-alone generators or temperature adjustment systems.

Protecting the Ozone Layer

Action Plan

Medium/Long-Term Goal
Cessation of use of alternative CFCs (HCFCs) by the end of FY2003

Result for FY2002
Completion of development of technologies for the transition from alternative CFCs to new CFCs and non-CFC products for which the ozone depletion coefficient is zero.

Eliminating CFCs

Specified CFCs* and alternative CFCs (HCFCs)* both damage the ozone layer, and schedules for their total elimination have been established under international agreements. The Group totally eliminated CFCs, which were used as foaming agents for polyurethane foam, in 1995. It plans to cease all use of HCFC-141b, which it currently uses as CFC alternative, by the end of 2003. This will be achieved through the use of the next-generation HFC foaming agents, HCs, which are used mainly in household refrigerators, and water-blown foaming. The most promising next-generation foaming agent is HFC-245a, which can be used to produce foam that is safe and has excellent thermal insulation characteristics. However, while it is non-flammable, it has a low boiling

point. This is a major drawback, since it causes the steam pressure in the rigid polyurethane liquid to rise. To overcome this problem, the Toyo Group and a CFC manufacturer jointly developed HFC-245fa, a blended foaming agent designed specifically for use with rigid polyurethane. A joint patent application has been filed covering the use of this foaming agent in the production of rigid polyurethane foam.

As a major polyurethane manufacturer, the Group will continue to take the lead in the development of CFC countermeasures. It has already developed technology to reduce thermal conductivity using water-blown foaming technology, as well as a practical pentane-based foaming method.

Spray Application of the Next-Generation Foaming Agent—Soflan-R

This HFC-based product has an ozone depletion coefficient of zero. It has excellent thermal insulation and fire-resistance characteristics and can be used to provide excellent sealing in any type of home.



Soflan SP2 Board—Manufactured Using a Pentane Foaming Agent

This environment-friendly construction material consists of a heat-insulation layer of rigid polyurethane sandwiched between soft surface materials. Its ozone depletion coefficient is zero.



■ Foaming Methods and Environmental Impact

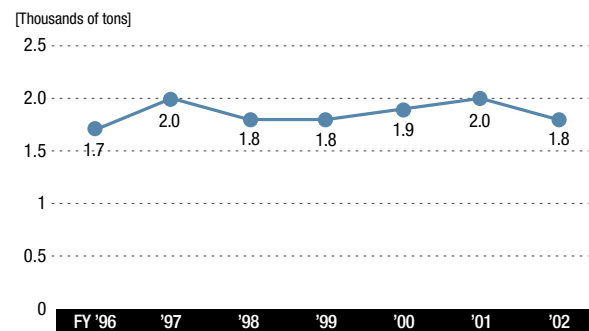
Foaming method		Ozone Depletion Coefficient*
CFC-Based	Category	
Chlorine-based CFCs	Specified CFCs (CFC11)	1.0
	Alternative CFCs (HCFC-141b)	0.1
Dechlorinated CFCs	New CFCs (HFC-134a)	0
	New CFCs (HFC-245fa)	0
	New CFCs (HFC-365mfc)	0
Non-CFC products	Pentane foaming agents	0
	Water-blown (CO ₂ gas)	0

*The higher the ozone depletion coefficient, the greater the damage caused to the ozone layer.

★ **Specified CFCs** are substances made from chlorine, fluorine and carbon. Their total elimination by the end of 1995 was mandated under international agreements after it was discovered that they cause depletion of the ozone layer when their chlorine content is released when they are broken down by ultraviolet rays in the stratosphere. There are five types (CFC11, 12, 113, 114 and 115).

★ **CFC alternatives (HCFCs)** also contain chlorine, but because of their hydrogen content they are seen as posing a lesser threat to the ozone layer. However, a resolution was passed at the Fourth Meeting of the Parties to the Montreal Protocol, calling for their total elimination, in principle, by 2020. CFC alternatives include HCFC141b and 123.

■ Usage of HCFC141b as CFC Alternative



*The data in this graph refer to calendar years (January–December).

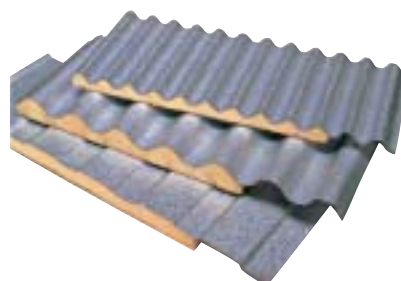
Soflan-R Liquid Water-Blown Foam for Use in Metal Sidings

The Toyo Group has led the industry in the development of new water-blown foaming technology and was the first to introduce 100% non-CFC products.



Toyo Galdan Water-Blown Foam

This thermal insulation board is used in livestock sheds. It consists of water-blown rigid polyurethane foam molded to sheets of highly durable galvalume steel sheets.



Blended HFC-254fa Foaming Agent for Use with Rigid Polyurethane Foam

Rigid polyurethane foam is sprayed inside buildings to prevent condensation. Because it is used on-site, it is difficult to control the temperature of the liquid foam. HFC-245fa, which is seen as a promising next-generation foaming agent, is non-flammable but its boiling point is only 15°C, making it difficult to handle in summer. To overcome this problem, the Group and a CFC manufacturer have jointly developed a blended HFC-254fa foaming agent for use with

rigid polyurethane foam. The use of this blended product as a foaming agent for rigid polyurethane foam offers a number of advantages. First, the liquid polyurethane foam and the foaming agent are both non-hazardous substances at the steam pressure level used for actual spraying work. Second, existing foaming equipment can be used. Additionally, the new product matches HCFC-141b in terms of moldability, performance and quality.

Eliminating CFCs

1989	CFC Task Force established	1995	Use of specific CFCs in rigid polyurethane foam production totally eliminated through use of technology based on alternative foaming agent and CFC alternative
1991	Specified CFC-free rigid polyurethane foaming liquid developed	1998	Manufacturing technology developed for fire-resistant water-blown rigid polyurethane foam produced without the use of HCFCs (CFC alternatives) or HFCs (new CFC)
1992	Toyo Galdan developed (This CFC-free thermal insulation board consists of rigid polyurethane foam molded to durable galvalume steel sheets. It is used as thermal insulation material for livestock sheds.)	1999	Transition to water-blown foaming; establishment of foaming technology based on new CFCs with zero ozone depletion coefficient; start of research into practical use of non-CFC pentane foaming method
1994	Use of specified CFCs in soft polyurethane foam totally eliminated through development of alternative foaming agents and changes to materials	2001	Start of transition to new CFCs with zero ozone depletion coefficient (target date: end of 2003)
1994	Industry's first specified CFC-free Grade-2 incombustible rigid polyurethane spray foam developed	2002	Blended HFC-245fa foaming agent for rigid polyurethane foam developed jointly with CFC manufacturer
1995	Use of trichloroethane as a bumper cleaning agent eliminated through modifications to cleaning agent and production facilities		

Managing Chemical Substances

Action Plan

Target Levels and Results for FY2002

<Dichloromethane consumption>
 Target quantity: 458 tons
 Actual quantity: 406 tons
 Achievement ratio: 111.4%

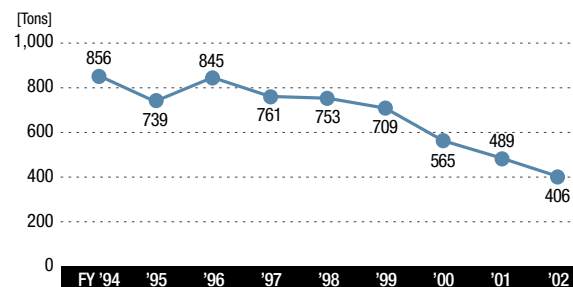
Target for FY2003

<Dichloromethane consumption>
 Reduction of use of dichloromethane as a cleaning agent

Reduction of Dichloromethane* Use

The Toyo Group uses dichloromethane as a foaming agent for rigid polyurethane foam. However, it is a chlorine solvent and has been identified as having a significant environmental impact. It is also regulated under various environmental laws. For these reasons, the Group is actively working to eliminate its use. In FY2002, the amount of dichloromethane consumed was reduced by 17% below the previous year's level to 406 tons, thanks to the introduction of an alternative cleaning agent.

Trends in Dichloromethane Consumption



Compliance with PRTR Law*

Pollutant Release and Transfer Register for the Toyo Group in FY2002

The following table lists releases and transfers of 1 ton or more per year of chemical substances identified in the PRTR law (0.5 tons or more for Specific Class 1 Designated Chemical Substances).

Official Number	Substance	CAS No.	Amount Released (kg)			Amount Transferred (kg)	
			Atmosphere	Water	Soil	Waste	Sewer
1	Water-soluble zinc compounds	—	0	0	0	4,073	0
9	Bis (2-ethylhexyl) adipate	103-23-1	0	0	0	38	0
25	Antimony and its compounds	—	0	0	0	0	0
32	2-imidazolidinethione	96-45-7	0	0	0	0	0
40	Ethylbenzene	100-41-4	755	0	0	259	0
43	Ethylene glycol	107-21-1	0	0	0	708	0
44	Ethylene glycol monoethyl ether	110-80-5	7,554	0	0	119	0
59	p-octylphenol	1806-26-4	0	0	0	14	0
63	Xylene	1330-20-7	168,268	0	0	32,998	0
100	Cobalt and its compounds	—	0	0	0	263	0
101	2-ethoxyethyl acetate (<i>ethylene glycol monoethyl ether acetate</i>)	111-15-9	25,372	0	0	238	0
115	N-cyclohexyl-2-benzothiazolesulfenamide	95-33-0	0	0	0	9,791	0
120	3,3'-dichloro-4,4'-diaminodiphenylmethane	101-14-4	0	0	0	0	0
132*	1,1-dichloro-1-fluoroethane; HCFC-141b	1717-00-6	53,409	0	0	3,799	0
145	Dichloromethane; methylene dichloride	75-09-2	226,014	0	0	18,008	0
159	Diphenylamine	122-39-4	0	0	0	6	0
172	N,N-dimethylformamide	68-12-2	1,271	0	0	2,545	0
177	Styrene	100-42-5	0	0	0	0	0
179	Dioxins	—	22	0	0	620	0
198	Hexamethylenetetramine	100-97-0	0	0	0	470	0
200	Tetrachloroethylene	127-18-4	2,698	0	0	4	0
204	Tetramethylthiuram disulfide (<i>thiram</i>)	137-26-8	0	0	0	0	0
224	1,3,5-trimethyl benzene	108-67-8	14,509	0	0	0	0
227	Toluene	108-88-3	309,615	0	0	42,103	0
230	Lead and lead compounds	—	0	0	0	0	0
249	Zinc bis (N,N-dimethyldithiocarbamate) (<i>ziram</i>)	137-30-4	0	0	0	0	0
266	Phenol	108-95-2	1,101	0	0	0	0
270	Di-n-butyl phthalate	84-74-2	0	0	0	0	0
272	Bis (2-ethylhexyl) phthalate	117-81-7	635	0	0	11,463	0
282	N-(tert-butyl)-2-benzothiazolesulfenamide	95-31-8	0	0	0	3,832	0
299	Benzene	71-43-2	960	0	0	30	0
307	Poly (oxyethylene) = alkyl ether (limited to substances in which the alkyl base has current has a carbon number of 12-15, or compounds thereof)	—	940	0	0	180	0
309	Poly (oxyethylene) nonylphenyl ether	9016-45-9	0	0	0	1,138	0
338	Methyl-1,3-phenylene diisocyanate; m-tolylene diisocyanate	26471-62-5	0	0	0	11,742	0
352	Tris (2-chloroethyl) phosphate	115-96-8	0	0	0	0	0

*Quantities are stated in kilograms, except for dioxins, which are stated in mg-TEQ/year units (two significant digits).

* In Environmental Report 2002 the atmospheric release quantity for substance 132 was erroneously stated as 909,672. The correct figure was 60,552.

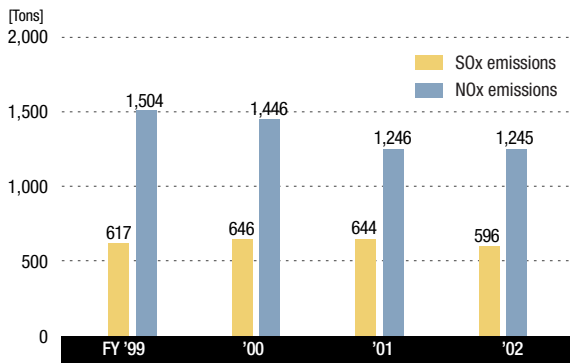
★ **Dichloromethane** has the highest dissolving power of any chlorinated solvent. It is practically non-combustible, and since it also has a low boiling point, it is widely used for cleaning heat-sensitive parts.

★ **The Pollutant Release and Transfer Register (PRTR) Law** (official title: the Law Concerning Reporting, etc. of Releases to the Environment of Specific Chemical Substances and Promoting Improvements in Their Management) requires comprehensive monitoring of releases and transfers of chemicals that are potentially harmful to human health or ecosystems. Businesses are required to notify the authorities of all releases of such substances into the environment, and of transfers of such substances out of their facilities in waste. The government compiles and publishes data based on these notifications.

Preventing Atmospheric Pollution and Odors

We are working to reduce the level of sulfur dioxide (SO_x) emissions in stack gas from fuel oil boilers. This is being achieved through the use of fuel oil A instead of fuel oil C, and through the installation of stack gas desulfurizers. Odor prevention measures include the installation of stack gas deodorizing systems and direct heating deodorizing systems. The Group is also reducing SO_x and nitrogen oxide (NO_x) emissions by introducing cogeneration systems designed to be fueled by used tires.

■ Trends in SO_x and NO_x Emissions

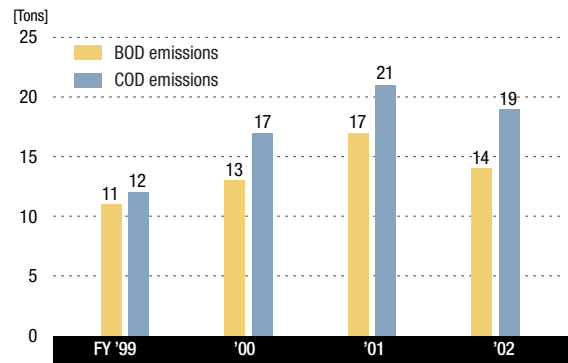


A direct heating deodorizing system

Preventing Water Contamination

Factory wastewater is treated to remove oils and adjust pH levels before it is discharged into open bodies of water. Automatic nitrogen and phosphorus measuring equipment has been installed at some of the sites in readiness for the introduction of restrictions on total quantities of these substances, and there are plans for the installation of systems at other sites in this category.

■ Trends in BOD and COD Emissions



Left: Automatic nitrogen and phosphorus measuring system
Right: Automatic COD measuring system

Preventing Soil and Groundwater Contamination

Outdoor tanks containing chemicals and oil are surrounded by protective walls to prevent soil and groundwater contamination in emergency situations.



A dichloromethane storage tank with a protective wall



A protective wall

Reducing Industrial Waste

Action Plan

Medium/Long-Term Goals

Reduction of direct disposal at landfill sites to 1% or less of total waste by FY2005

Target Levels and Results for FY2002

<Direct disposal at landfill sites>
 Target volume: 3,940 tons
 Actual volume: 4,542 tons
 Achievement ratio: 84.7%

Target for FY2003

<Direct disposal at landfill sites>
 1,730 tons

Zero emissions

The zero emission policy of the Toyo Group calls for the reduction, reuse and recycling of waste. The aim is to limit total disposal at landfills to no more than 1% of total production. The entire Group is working toward zero emission status, and in FY2002 Fukushima Rubber Co., Ltd. achieved this goal. It is hoped that the Sendai Plant and the Hyogo Manufacturing Complex will achieve zero emission status in FY2003.

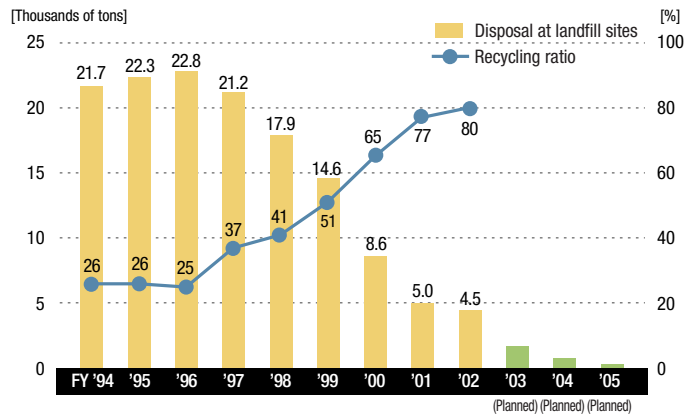


A waste sorting facility operated by Fukushima Rubber Co., Ltd.

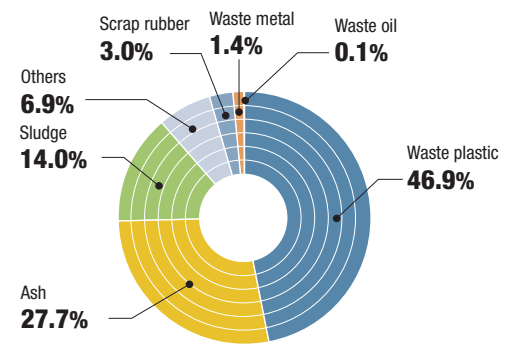
Reducing Industrial Waste

Direct disposal at landfill sites amounted to 4,542 tons in FY2002, a reduction of 9.8% from the previous year's level. Though the target was not reached, a recycling ratio of 80% was achieved.

Landfill Disposal of Industrial Waste and the Recycling Ratio



Types of Direct Landfill Waste



Appropriate Disposal

The main changes introduced as a result of the amendment of Waste Management and Public Cleansing Law in 2001 related to (1) the establishment of waste reduction plans by businesses producing large volumes of waste, (2) amendments to the manifest system, and (3) a prohibition on open

incineration. The Toyo Group ensured that its manifest documents are managed in accordance with the amended law and conducted its own confirmation of final disposal sites. The Group has also worked to reduce waste.

Protecting Water Resources

Target Levels and Results for FY2002

<Water consumption>
 Target: 3,400,000m³
 Actual: 3,521,000m³

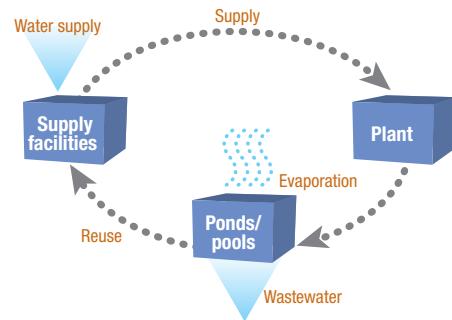
Target

<Water consumption>
 Not to exceed the 2000 level

Action Plan

Using Water Resources Effectively

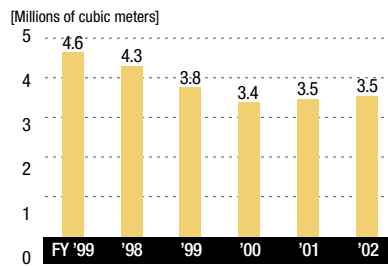
We have implemented numerous initiatives designed to protect water resources. Examples include a recycling method whereby water is collected in pools after use and made ready for reuse through natural or mechanical cooling. Water is also recycled through chillers attached to individual facilities. Another approach to the effective utilization of limited resources involves the collection and use of spring water.



Performance in FY2002

The Toyo Group used 3,521,000m³ of water in FY2002, compared with a target of 3,400,000m³. The higher total reflects increased consumption for tire manufacturing operations. The Group is determined to keep water consumption below the 2000 level and will continue to monitor volumes used and maximize reuse.

Water Consumption



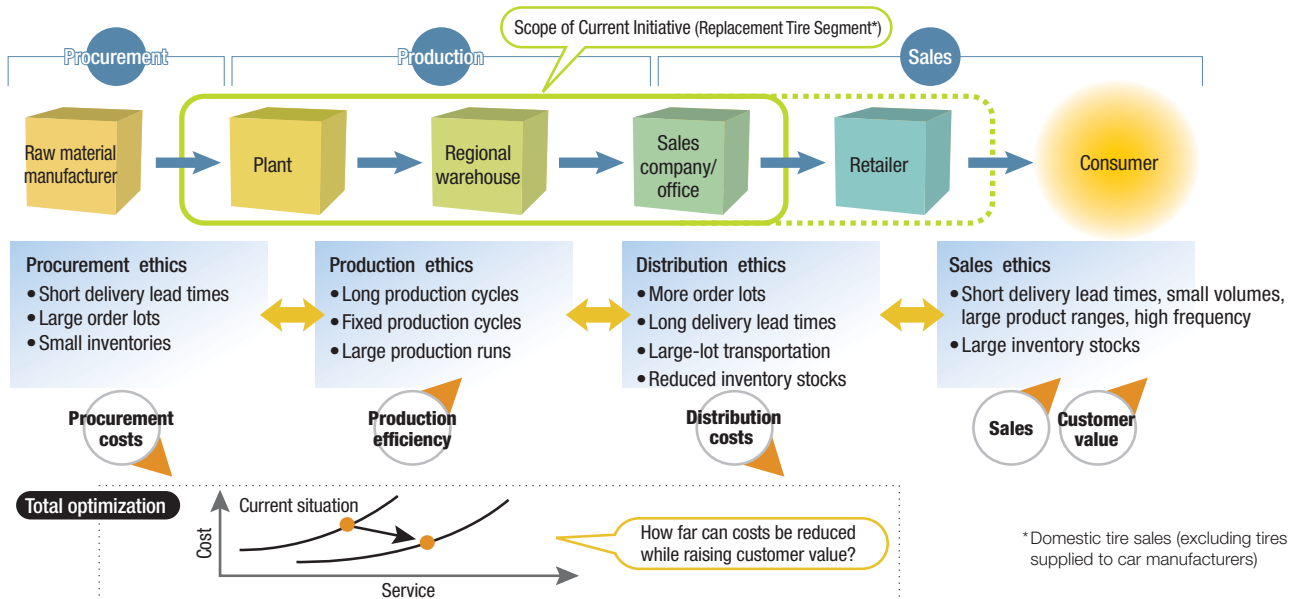
A water cooling and recycling facility

Distribution

Initiatives at the Distribution Stage

Supply Chain Management

At the distribution stage, the Group is using supply chain management (SCM) techniques to reduce the environmental impact and cost of distribution operations in all business segments. SCM involves the restructuring of operating processes to achieve optimization across multiple business segments. The aim is to maximize customer satisfaction and minimize costs in all activities relating to the supply of products, from the procurement of raw materials through to the supply of finished products to consumers. Efforts are currently focusing on the replacement tire segment. The concept encompasses all stages from plants to sales companies and sales offices. It is planned to expand the target in stages to include all levels from procurement to end users.



Environment-Friendly Products

Tires

Helping to Reduce Fuel Consumption with Run-Flat Tires

We led the development of run-flat tires and introduced commercial products as early as 1981 for use on police cars and vehicles operated by physically challenged drivers. Even if the air pressure in these tires falls to zero because of a puncture or other problems, the vehicle can be driven safely at limited speed over a specified distance. Their use eliminates the need for spare tires and wheels, which are

commonly discarded without ever having been used. The Toyo Group will continue to develop run-flat tires. Development goals include the reduction of rolling resistance and weight without any reduction in safety and comfort. The aim of this work is to reduce environmental loads by achieving further improvements in fuel efficiency.

Low-Noise Tires

The advent of the motorized society and the resulting growth of traffic volumes have been accompanied by an increase in noise. This problem is especially serious in hous-

ing areas along major roads. The Group is focusing on the development of low-noise tires designed to reduce exterior vehicle noise without compromising basic tire performance.

Fuel-Efficient Tires

The diversification of motoring lifestyles in recent years has increased the complexity of the requirements placed on tires. At the same time, today's environmentally aware consumers are demanding tires with environment-friendly performance characteristics. We have responded to these needs by developing the TRANSAS TEO range of tires, which are designed to reduce vehicle fuel consumption in sedan cars. It has also developed the ZEROSYS M166 and ZEROSYS M666 truck and bus tires. These tires are helping to lower both environmental loads and costs, both of which are top priorities in the trucking industry, by reducing fuel consumption.



TRANSAS TEO

ZEROSYS M166

ZEROSYS M666

• Car tires

■ Rolling resistance



15%
improvement compared with earlier products

[Tire test conditions] Test data obtained using drum-type rolling resistance tester/

Tire size: 195/65R15 91H (S for NP01) Rims: 15x6JJ Tire air pressure: 220 kPa Load: 450kgf

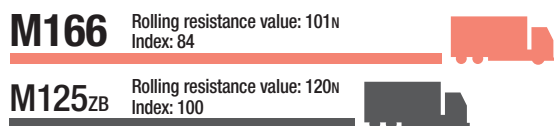
• All tests compared Toyos TRANSAS TEO and Toyo NP01 radial car tires.

• Detailed data from these tests have been submitted to the Tire Fair Trade Council.

• Truck and Bus Tires

■ Rolling Resistance Comparison of ZEROSYS M166 and ZEROSYS M666

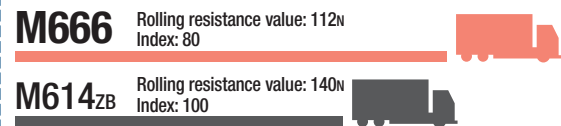
Rolling resistance comparison



Test site Toyo Tire & Rubber Co., Ltd. / Toyo Technical Center
 Test tires: • Tire evaluated /Toyo M166 11R22.5 14 PR (new)
 • Tire compared /Toyo M125ZB 11R22.5 14PR
 Test conditions: • Test facility: Drum-type rolling resistance tester • Rim size: 22.5X7.50 • Tire air pressure: 700kPa
 • Load: 2500kgf Measured temperature: 25±1°C

16%
improvement compared with earlier products

Rolling resistance comparison



Test site Toyo Tire & Rubber Co., Ltd. / Toyo Technical Center
 Test tires: • Tire evaluated /Toyo M666 11R22.5 14 PR (new)
 • Tire compared /Toyo M614ZB 11R22.5 14PR
 Test conditions: • Test facility: Drum-type rolling resistance tester • Rim size: 22.5X7.05 • Tire air pressure: 700kPa
 • Load: 2500kgf • Measured temperature: 25±1°C

20%
improvement compared with earlier products

■ Chemical and Industrial Products

Soflan-R Shadan

The Shadan Q external insulation system for detached houses is based on the use of rigid polyurethane board with excellent airtightness, heat insulation and durability characteristics. This method increases the life of houses, since no condensation will form on the interior surface of the insulation material.



Cross-sectional structure of a building in which the Shadan system has been used.

Catechin-Based Polyurethane Foam

There is growing demand for products that contribute to health and hygiene. The Group is responding to this need by manufacturing and selling people-friendly polyurethane foam. Instead of conventional synthetic chemicals, the product is based on catechin, a natural extract from the tea plant. Catechin has antibacterial and deodorizing properties.



The Soflan Mujuryoku
—A catechin foam pillow

Effective Use of Rainwater

Urban flooding caused by localized downpours can be alleviated by trapping rainwater in block-shaped underground spaces created by burying injection-molded baskets made from polypropylene thermal plastic. The water collected in this way can be used effectively as a water supply for sprinklers, car washes, toilets, and fire prevention. Construction is safe and easy, since the spaces are created by assembling blocks. Because no cement is used, construction can be completed rapidly, and the use of container-grade polypropylene ensures excellent strength under pressure, so the space above the facility can be used effectively. And

since the structure is flexible, its ability to withstand earthquakes is superior to that of conventional concrete water tanks. In addition, construction costs can be reduced by 30-40% compared with conventional methods.



A rainwater storage permeation system built using the TUTT method

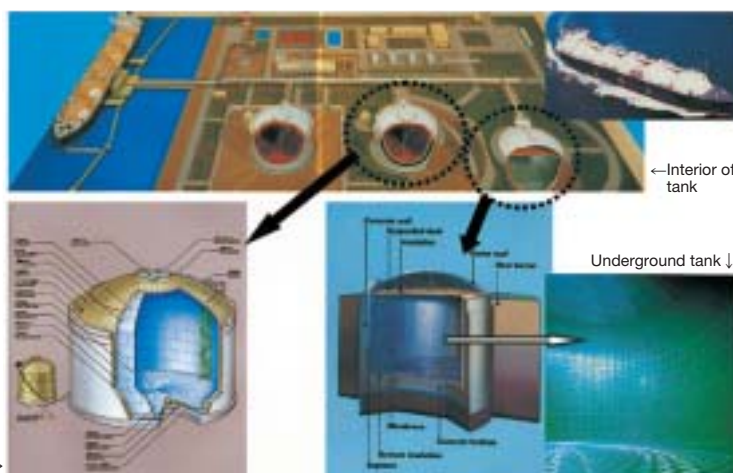
Soflan GL High-Board

Soflan GL High-Board is a special thermal insulation board for use in cryogenic applications, such as LNG tanks and tankers. It helps to save energy by maintaining low temperatures.



Soflan GL High-Board

Above-ground tank→



■ Automotive Parts

Product-Related Initiatives

The development of lighter automobile parts is vital to the improvement of fuel efficiency. The Toyo Group has developed and commercialized a variety of related products, including high-performance vibration-reducing engine mounts, anti-vibration rubber with aluminum parts to reduce weight, lightweight resin-based CVJ boots, and low-density, lightweight seat cushion pads.



Vibration-reducing engine mounts



Rubber vibration damper with aluminum parts



Resin CVJ boot



Low-density, lightweight seat cushion pad

Development of Technologies for Product Recovery and Recycling and Recycled Products

Medium/Long-Term Goals

Action Plan

- Development of recycling technologies and recycled products
- 1) Development of recycled products made from used tires and other materials
- 2) Development of products made from recycled polyol*

Tires

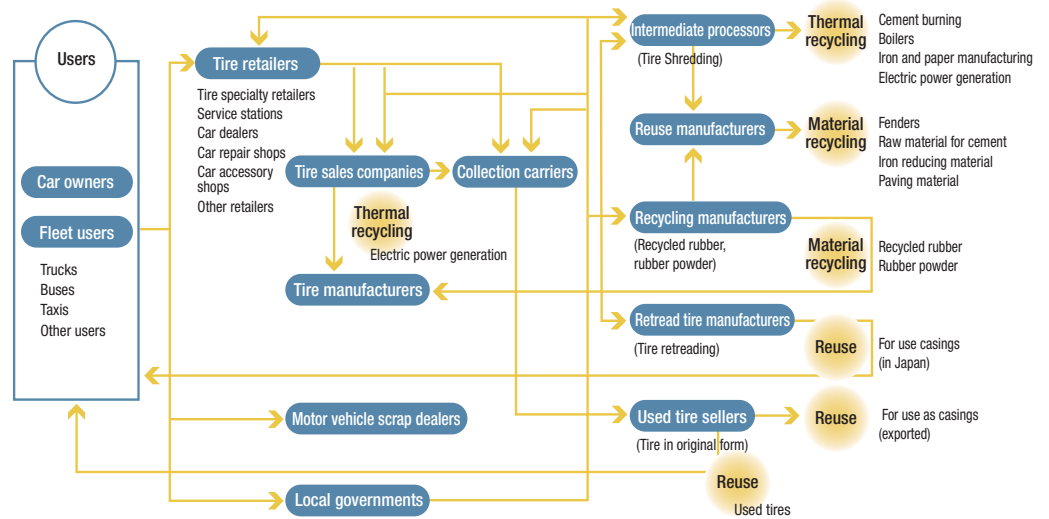
Used Tire Recycling (Industry-Level Initiatives)

The tire industry regards the recycling of used tires as a major priority, and the entire industry is working to reduce the volume of used tires and to promote reuse or appropriate disposal. Industry participants have adopted a “mani-

fest” system designed to prevent the illegal or inappropriate disposal of used tires and encourage proper disposal through the use of waste control documents.

Recovery Route

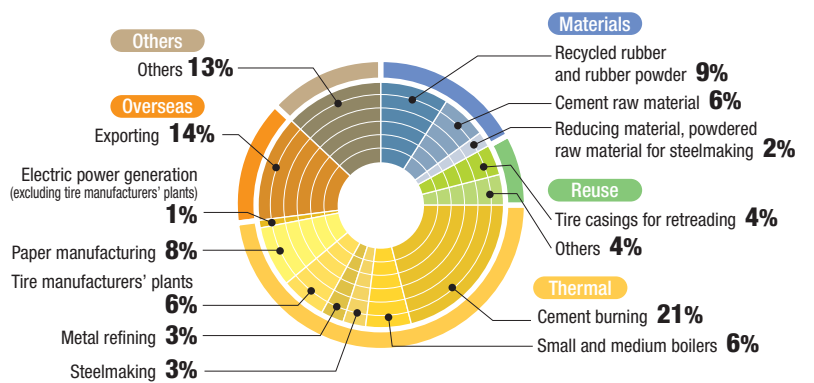
The recovery process established by the Toyo Group for used tires is shown in the diagram on the right. Used tires are collected from car owners via tire retailers and other outlets. They are then passed to tire sales companies, collection carriers or intermediate processors for thermal recycling, material recycling or reuse.



Types of Recycling

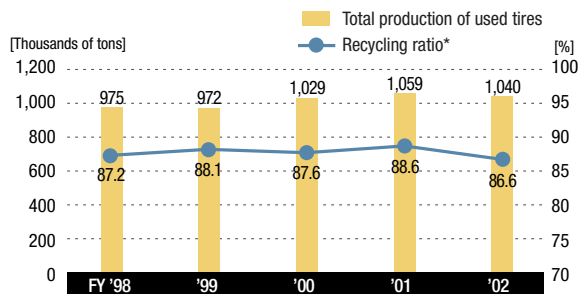
Used tires contain various materials. The steel is used in cement and steel manufacturing, while the sulfur is used as a raw material and the carbon as a reducing material. Even the ash is used as a raw material. The Japan Tire Recycling Association has calculated the totals for the various classes of recycling as follows.

- (1) Material recycling: 178,000 tons (17% of total)
- (2) Reuse: 81,000 tons (8%)
- (3) Thermal recycling: 494,000 tons (48%)
- (4) Exporting (used tires or casings): 148,000 tons (14%)
- (5) Other methods: 126,000 tons (13%)



Used Tire Volumes

In FY2002, Japan produced a total of 106 million used tires (1,040,000 tons), a slight decline from the previous year's figure. This total consists of 82 million replaced tires and 24 million tires from scrapped vehicles. The number of tires has now exceeded 100 million in four successive years, while the weight has been above one million tons for three years.



* Recycling ratio = (Material recycling + thermal recycling + reuse + exports + other uses)/total tire product

* Polyol is the main raw material for polyurethane liquid. The two main raw materials for polyurethane liquid are polyol and isocyanate.

Waste Tire Recycling—Corporate Initiatives

Reusing Tires

A retreaded tire is manufactured by replacing the worn tread with new tread rubber and vulcanizing the tire. We use casings from used tires to produce retreaded tires for a wide range of vehicles, including trucks, buses, construction machinery and aircraft. Following changes to the Law on Promoting Green Purchasing and the Basic Policy on the Promotion of Procurement of Eco-Friendly Goods and Services by the State and Other Entities in April 2002, there is a new obligation to reuse motor vehicle tires.



Cement raw materials and concrete color agents made from fly ash

Double Recycling of Tires

The Sendai Plant has installed a cogeneration system fueled by used tires. Fly ash from this system is fully recycled as cement raw materials and concrete coloring agents, while bottom ash is recycled as a ground filling material or cement and soil improver.



Tetsujin no Tsuchi is a soil improver made from bottom ash.



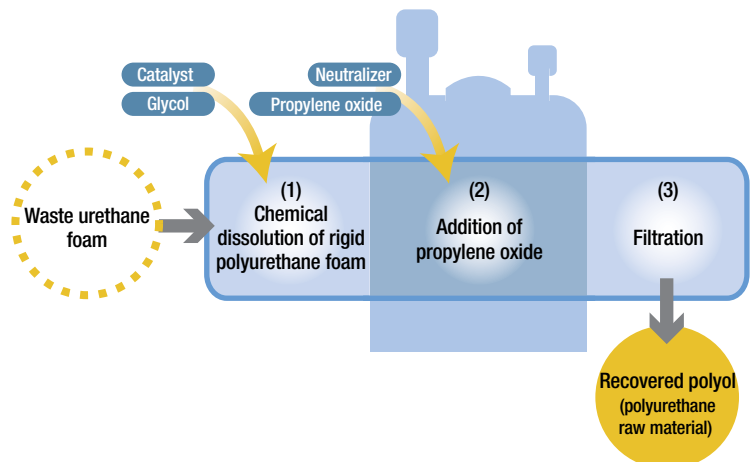
Harmony with local scenery and the use of recycled materials are key priorities for projects in Gifu Prefecture. Environmental colors have been used throughout this river improvement project, the aim of which is to prevent erosion and provide a path for fish. (Hachiman, Gujo-gun, Gifu Prefecture)

Chemical and Industrial Products

Recycling Chemical and Industrial Products

The Toyo Group has developed its own technology to break down rigid polyurethane foam products into polyol, which is a principal raw material. Since 1975, it has operated the only commercial plant in the world for this purpose. One of the raw materials for Toyo Galdan, a non-CFC rigid polyurethane product, is recycled polyurethane foam. There is growing interest in this environment-friendly product from the viewpoints of ozone layer protection and resource conservation.

Recovery of Polyol from Rigid Polyurethane Foam



Coexistence with Society—Relationships with Employees

Consideration for local environments is vital to maintenance of a world in which everyone, young or old, can enjoy safe and comfortable lives. We undertake a wide range of environmental protection activities, not only as a company, but also as a member of local communities, and these activities are based on good communication with all members of communities.

Helping the Earth in Partnership with Communities

The Toyo Environmental Protection Fund



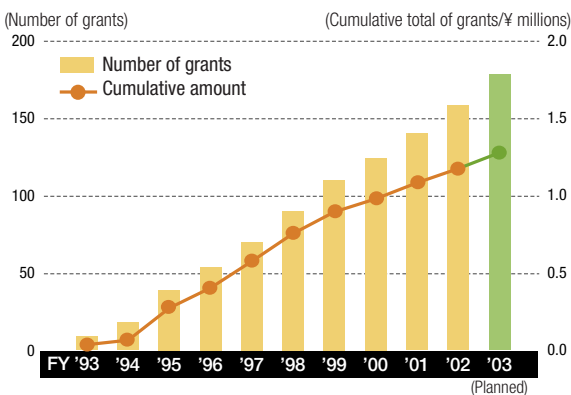
Members of the River Yura Network, a non-profit organization, release young fish.

In 1992, we established the Toyo Environmental Protection Fund within the Osaka Community Foundation. Since then, it has continued to provide grants for non-profit organizations involved in global environmental protection activities. The fund is a reflection of the harmony that exists between the environmental concern of employees as individual citizens, and a corporate stance that emphasizes care for the environment in the context of business activities. It is funded under a matching gift system, whereby the Company

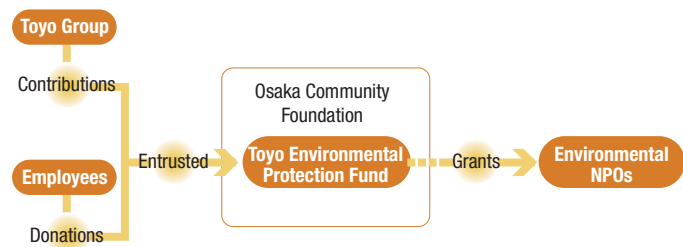
matches donations from employees. Because donors wish to see their funds applied to regionally based social contribution activities, grants are provided mainly in regions in which the Group has facilities.

In the 10 years since the establishment of the Fund, grants totaling ¥100 million have been provided. In FY2002, 18 organizations received grants amounting to ¥9.17 million. In FY2003, 20 organizations will receive a total of ¥10.265 million in grants.

Number and Amount of Grants



Toyo Environmental Protection Fund



Grants Provided in FY2002

Category	Recipient	Activities	Coordinating Organization for Grant
Environmental protection	"Forest of Birds" Preservation Club*	Protection of forest environments	Fukushima Rubber Co., Ltd.
	River Yura Network (NPO) **	Hosting of River Yura Symposium	Ayabe Toyo Rubber Co., Ltd.
	Japanese Society for Wild Geese Protection*	Public education concerning protection of the Japan goose	Sendai Plant
	Clean River Hirose Society	Environmental protection of Hirose River	
	Keep Mt. Aoba Green	Publication of "Aoba Forest Guidebook"	Kuwana Plant
	Toin Floricultural Club	Cultivation of plants and flowers for provision to public facilities	
	The Society for the Protection of Pine, Bamboo and Plum Trees	Removal of dead pines and planting of new trees	Head Office
	Land's Circle Network	Planting of broadleaf trees	
	Beech Tree Planting Society	Development and protection of beech forests	Hyogo Manufacturing Complex
	Never-ending International Work Camp Exchange (NICE)	Protection of Tomita Forest	
Environmental education	The Society for the Protection of Cherry Trees	Forest development	Fukushima Rubber Co., Ltd.
	Fukushima City Miyashiro Workshop	Environmental education through use of EM organisms to produce compost	
	Environmental Counselors Association Hyogo (NPO)	Community activities targeted toward environmental protection	Hyogo Manufacturing Complex
	The Society for Studying Wild Life* (NPO)	Production of booklets for distribution to local governments	
	Osaka Environmental Counselors Association (NPO)	Hosting of environmental seminars	Head Office
	Nagoya Municipal Shidami Nishi Elementary School	Environmental education concerning firefly breeding	
	Hagino Nature Watching Society	Nature observation events in the Ogino district	Toyo Soflan Co., Ltd.
	Seki Town Green Boys Club	Construction of huts for nature-related activities	T.G.K. Co., Ltd.

*Details on Page 28 **See photograph at top of page.

Activities by Recipients of Toyo Environmental Protection Fund Grants

"Forest of Birds" Preservation Club

This group was formed in 2001 to restore and maintain forest environments, which were once a familiar part of life in rural Japan. The group's activities center on a three-hectare area of former farmland in Fukushima City's Forest of Birds. There are approximately 30 members, most of whom are white-collar workers. Activities include the creation of ponds for dragonflies, training in charcoal-making, the improvement and extension of waterways as habitats for fireflies and fresh-water crabs, and the release of young fish. Through these activities, the group helps to maintain the forest environment while providing recreation for its members.



Japanese Society for Wild Geese Protection

Land reclamation and drainage have reduced the area of marshlands, which provide landing areas and habitats for wild geese. This group is working to expand areas of paddy fields flooded with fresh water in winter as well as summer, to provide landing and feeding grounds for the geese. The group also hopes to diversify the areas used by migrating geese, 80% of which congregate in the northern part of Miyagi Prefecture. In FY2002, the group conducted a survey in Miyagi Prefecture and produced leaflets.



The Society for Studying Wild Life (NPO)

Since its establishment in 1992, this group has conducted surveys and research concerning wildlife. Its aims are to provide information based on this research to residents and educators, to raise public awareness about the natural environment, and to train people in nature-related activities. Most of the group's 30 members work in the education sector. Achievements in FY2002 include the publication of an updated version of a book on the Mukogawa River, which was originally compiled and published in 1993. The book has been distributed to approximately 320 elementary and junior high schools in the region.



Grants Planned for FY2003

Category	Recipient	Activities	Coordinating Organization for Grant
Environmental protection	Marunuma Moat Protection Society	Beautification and cleaning of urban drainage water	Sendai Plant
	"Forest of Birds" Preservation Club	Protection of rural forest environment	Fukushima Rubber Co., Ltd.
	Arakawa Clean Aid Forum (NPO)	Improvement of river environment on Arakawa River	Head Office
	Toin Floricultural Club	Cultivation of plants and flowers for provision to public facilities	Kuwana Plant
	The Society for the Protection of Pine, Bamboo and Plum Trees	Removal of dead pines and planting of new trees	T.G.K. Co., Ltd.
	Sakashita Society	Release of young fish into Suzuka River	Hyogo Manufacturing Complex
	Action Committee for the Creation of Rural Forest Environments with Medaka Fish in Rivers	Observation and protection of model zone	Hyogo Manufacturing Complex
	Tatsuno City Consumer Lifestyle Research Group	Recycling and repair of household items	Head Office
	Kamibayashi River Beautification Society	Improvement of water quality in Kamibayashi River	Ayabe Toyo Rubber Co., Ltd.
	Land's Circle Network	Planting of broadleaf trees	Head Office
	Beech Tree Planting Society	Development and protection of beech forests	Head Office
	Niigata Prefecture Nature Observation Guidance Society	Forest restoration on Gozu Ski Field	Head Office
Rape Flower Project Network	Cooking oil recycling, hosting of summit meeting	Head Office	
Environmental education	Fukushima City Miyashiro Workshop	Environmental education through use of EM organisms to produce compost	Fukushima Rubber Co., Ltd.
	Environmental Counselors Association Hyogo (NPO)	Environment-related social activities	Hyogo Manufacturing Complex
	Naturalist Club	Human resource development through forest conservation	Hyogo Manufacturing Complex
	Tatsuno City Children's Eco Club	Environmental education in natural surroundings	Hyogo Manufacturing Complex
	Ayabe Citizens' Environmental Council	Housing of Cosmos festival and seminars	Ayabe Toyo Rubber Co., Ltd.
	Yamato Mahoroba NPO Center (NPO)	Environmental education for elementary and junior high school children	Head Office
	Citizens' Alliance for Saving the Atmosphere and the Earth (NPO)	Human resource development for environmental education for elementary and junior high school children	Head Office

Community Clean-up Initiatives

Our sites regularly organize clean-up projects for rivers, beaches, parks and other public spaces in the surrounding areas. Employees and their families participate in these initiatives, together with local residents. In FY2002 a group-

wide total of 494 employees participated in clean-up projects. These activities also contribute to reciprocal communication, since they are widely promoted in local communities.



Cleaning a suburban road (Fukushima Rubber Co., Ltd.)



Sagami River clean-up campaign (Toyo Soflan Co., Ltd.)

Tree-Planting

The Toyo Group has a strong commitment to tree-planting as part of its efforts to create rich natural environments in the areas around its plants. In FY2002, it organized a tree-planting festival at the Diamond City Terrace, a shopping mall built on the former site of the Itami Plant. Members of the general public were invited to participate in the festival,

which resulted in the planting of 15,000 trees. The varieties, which included kunugi oak and myrica, were selected for their suitability for the local environment. At the Sendai Plant, employees are participating in tree-planting activities in surrounding area.



Local residents and employees participate in a tree-planting festival



The results of beautification efforts in front of the Sendai Plant

Toyo Kuwana Festival

The Kuwana Plant hosts the Toyo Kuwana Festival in alternative years as a way of informing local residents about the plant's activities and fostering communication. In FY2002,

there were over 1,600 visitors, including over 500 local residents.



The Toyo Kuwana Festival



Local residents enjoy activities at the Festival

TOPICS

The Toyo Tires Volleyball Team

In addition to their sales activities as employees of Toyo Tire Sales Kansai K.K., a Toyo Group company, members of the Toyo Tires volleyball team are enthusiastic proponents of their sport. They travel throughout Japan to take part in V1 League games and other tournaments. They also provide coaching for elementary and junior and senior high school students.

In FY2002, the team participated in five tournaments and won two.



Flowers and Trees Friendship Exhibition

Each year the Sendai Plant organizes and hosts the Flowers and Trees Friendship Exhibition. The aim of these events is to foster communication with local communities and inform the public about environmental initiatives through environment-related exhibits and activities, including gardening seminars.



Visitors enjoy an event at the Sendai Plant.

Plant Tours and Training

All Toyo Group plants host visits for local children and high school students and provide training programs. In FY2002, 2,669 young people participated in these activities. Participants learn about manufacturing operations and business activities at each plant, as well as the environmental initiatives of the Group.



A plant tour at T.G.K. Co., Ltd.



Student trainees at the Hyogo Manufacturing Complex



A plant tour at the Sendai Plant



Local residents tour the facilities of Ayabe Toyo Rubber Co., Ltd.

Environmental Reports

In 1992, the Group published an environmental report in pamphlet form. In 2000, that role was taken over by the Environmental Report. This is the fourth edition of the Environmental Report.



The 1992 Environmental Pamphlet



Environmental Report 2002

Information Disclosure Via the Internet

The content of the Environmental Report and information about the Toyo Environmental Protection Fund activities are published on the web site of the Toyo Group. The purpose of this initiative is to inform as many people as possible about the environmental efforts of the Group.



Environmental Report

http://www.toyo-rubber.co.jp/eco/index_report.html



Toyo Environmental Protection Fund

<http://www.toyo-rubber.co.jp/eco/index.html>

TOPICS

Environmental Labeling*

Environmental labels are used to provide environmental information about products and services. They are classified and standardized as Type I, Type II and Type III by the International Organization for Standardization (ISO).

- Type I: Labels certified by third-party organizations.
- Type II: Labels stating that an item is environment-friendly according to the manufacturer's standards and criteria.
- Type III: Labels providing quantitative data on environmental loads.

We certify environment-friendly products according to our own environmental standards and use Type II environmental labels on products, catalogs and other items to provide customers with environmental information on which to base product choices. The certification standards are currently under review.

An example of a product certified for a Type I labeling (Eco Mark approval) is the Eco Block. Made from recycled plastics, these highly durable blocks are used to form median strips on roads. They are designed for ease of installation and removal.



An Eco Block median strip

* **Environmental labels** help consumers to select products and services by providing information about the environmental precautions taken at each stage, from design and raw material procurement to production, consumption and disposal. Type I environmental labels are authorized by third-party organizations according to their own criteria. Type II labels are declarations by manufacturers that their products are environment-friendly. Type III labels contain quantitative data concerning environmental loads, such as the quantities of resources used.

Health and Safety, Accident Prevention—The “5S” Approach

Safety and Accident Prevention Activities

● Occupational Health & Safety and Disaster Management Policy for FY 2003

All employees will make safety their first priority, and managers and supervisors will provide strong leadership in a continuing effort to ensure that work environments are hazard-free and pleasant.

Safety management: All employees must follow basic rules and behave in accordance with operational standards.

Occupational health management: All employees must contribute to occupational health management and strive to maintain healthy, pleasant work environments.

Accident prevention management: Accident prevention management will be strengthened to prevent recurrences.

Work Place Safety and Employee Health

Employee safety and health are the most important considerations for an employer and part of every employer's social duty. The Toyo Group has a corporate philosophy that emphasizes respect for human beings. In accordance with that philosophy, group companies give first priority to safety. In addition to strict compliance with industrial health and safety laws and other related laws regulations, the Group implements voluntary health and safety measures and accident prevention initiatives. It also maintains extensive health

care systems designed to ensure the physical and mental well-being of employees. Employees undergo regular medical checks. Employees who are found to have health problems receive individual advice from industrial physicians and nurses about the improvement of lifestyles, diet and exercise habits. Every work site has mental psychiatric counselors who provide education, advice and information about mental health.

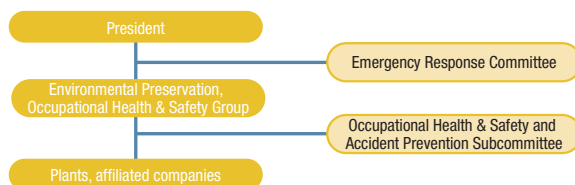


An emergency drill

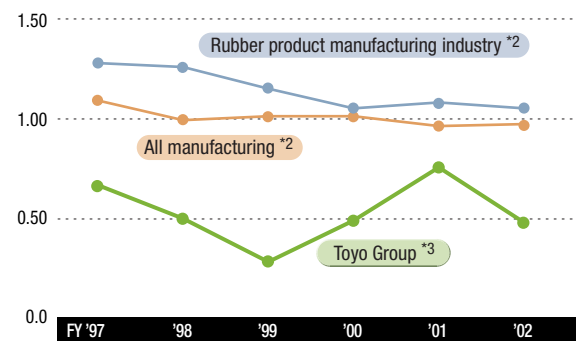


Practicing fire response procedures

■ Emergency Response Organization



■ Industrial Accidents/Absence Ratio ^{*1}



^{*1} Absence ratio = Number of absences due to accidents/total hours worked X10⁶

^{*2} Figures for all manufacturing industries and the rubber product manufacturing industry are based on Ministry of Health, Labour and Welfare surveys (Survey on Trends in Labor Accidents, updated results)

^{*3} Statistics for the Toyo Group are based on data for 16 sites, including affiliated companies.

5S Activities

● Action Policy for FY2003

- To establish 5S standards and promote 5S habits as basic requirements for good manufacturing
- To improve discipline and manners from a human resource development perspective

5S Activities as Basic Requirements for Good Manufacturing

The term "5S" refers to the Japanese words "seiri", "seiton", "seiso", "seiketsu" and "shitsuke", which respectively mean orderliness, tidiness, cleanliness, hygiene and discipline. The Toyo Group implements 5S activities as part of its efforts to create a corporate culture in which employees will think and act for themselves. The 5S concepts are basic requirements for good manufacturing. Benefits from 5S activities include improved quality, environmental improvements,

safety and health improvements, cost reductions, education, and increased customer empathy.



The orderly arrangement of tools facilitates quantity management



An orderly shipment yard

Data for Manufacturing Plants

Kuwana Plant

Location: 2400, Oaza Nakagami, Toincho, Inabe-gun, Mie Prefecture

Telephone: 0594-86-0100

Products: Automotive tires, automotive parts, plastic parts

Site area: 438,155 m²

Total floor area: 152,226 m²

Number of employees: 1,094



Air Pollution Measurements (Stack Gas Concentrations)

Facility	SOx (sulfur oxides)		NOx (nitrogen oxides)		Dust		Dioxins	
	Standard	Measured	Standard	Measured	Standard	Measured	Standard	Measured
No. 1 fuel oil C boiler	6	1.03	160	141	0.11	0.005		
No. 2 fuel oil C boiler	6	0.93	140	89	0.11	0.001		
No. 1 diesel engine	6	3.12	850	806	0.08	0.011		
No. 2 diesel engine	6	2.55	850	775	0.08	0.016		
No. 1 fuel oil A boiler	6	0.49	160	101	0.11	0.001		
No. 2 fuel oil A boiler	6	0.21	160	80	0.11	0.008		
Incinerator boiler	6	0.23	160	123	0.11	0.006		
Incinerator (stack gas)							10	3.2
Incinerator (ash)							3	1.3

Water Contamination Measurements

Item	Standard	Measured		
		Maximum	Minimum	Average
pH	5.8–8.6	7.9	7.4	7.6
BOD	160	4	1	2.3
COD	160	5	2	4
SS	200	9	2	5.2
n-Hex (mineral)	5	0.7	0.3	0.45
Nitrogen	120	6.4	0.53	1.4
Phosphorus	16	1	0.4	0.6
Coliform bacteria	3,000	<10	<10	<10

PRTR Substances

Official Number	Substance	Amount Released (kg)		Amount Transferred (kg)	
		Atmosphere	Water	Waste	Sewer
43	Ethylene glycol	0	0	0	0
44	Ethylene glycol monoethyl ether	4,024	0	0	0
59	p-octylphenol	0	0	14	0
63	Xylene	71,923	0	7,992	0
100	Cobalt and its compounds	0	0	120	0
101	2-ethoxyethyl acetate	9,449	0	0	0
115	N-cyclohexyl-2-benzothiazolesulfenamide	0	0	1,872	0
159	Diphenylamine	0	0	6	0
179	Dioxins	1.3	0	620	0
198	Hexamethylenetetramine	0	0	232	0
200	Tetrachloroethylene	2,698	0	4	0
227	Toluene	9,446	0	1,049	0
266	Phenol	1,101	0	0	0
282	N-(tert-butyl)-2-benzothiazolesulfenamide	0	0	1,070	0
309	Poly (oxyethylene) nonylphenyl ether	0	0	1,138	0

Sendai Plant

Location: 3-5-1 Fukiage, Iwanuma City, Miyagi Prefecture

Telephone: 0223-22-2191

Products: Automotive tires

Site area: 205,000 m²

Total floor area: 79,000 m²

Number of employees: 1,105



Air Pollution Measurements (Stack Gas Concentrations)

Facility	SOx (sulfur oxides)		NOx (nitrogen oxides)		Dust	
	Standard	Measured	Standard	Measured	Standard	Measured
Centralized smoke stack	11.5	1.05				
Desulfurizer (No. 1)	11.5	0.39				
Desulfurizer (No. 2)	11.5	0.44				
Fuel oil boiler			150	139		
Coal boiler			320	183	0.20	0.051

Water Contamination Measurements

Item	Standard	Measured		
		Maximum	Minimum	Average
PH	5.8–8.6	8.2	7.2	7.7
BOD	120	12	2.3	7.2
COD	120	20	4.3	12.2
SS	150	29	3.0	16
Fluorine	8	0.52	0.1	0.15
Boron	10	0.2	0.1	0.15
n-Hex (mineral)	5	1	0.4	0.7

PRTR Substances

Official Number	Substance	Amount Released (kg)		Amount Transferred (kg)	
		Atmosphere	Water	Waste	Sewer
63	Xylene	10,779	0	333	0
100	Cobalt and its compounds	0	0	143	0
115	N-cyclohexyl-2-benzothiazolesulfenamide	0	0	7,847	0
198	Hexamethylenetetramine	0	0	238	0
227	Toluene	10,513	0	325	0
282	N-(tert-butyl)-2-benzothiazolesulfenamide	0	0	2,762	0
299	Benzene	960	0	30	0

Notes

Air pollutant measurements

- The measurements stated represent the highest recorded values.
- The standards shown are the most stringent of those provided in the relevant laws, ordinances and agreements.
- Units of measurement for the standard values:
 - NOx: ppm
 - SOx: m³N/h for Fukushima Rubber Co., Ltd. and Toyo Soflan Co., Ltd.; K value for other sites
 - Dust: g/h for Toyo Soflan Co., Ltd.; and g/m³N for other sites
 - Dioxins: ng-TEQ/m³N in stack gas, ng-TEQ/g in ash

Water pollutant measurements

- The standards shown are the most stringent of those provided in the relevant laws, ordinances and agreements.
- Units of measurement: pH, mg/l, coliform bacteria per cm³
- pH: Hydrogen ion concentration
- BOD: Biochemical oxygen demand
- COD: Chemical oxygen demand
- SS: Concentration of suspended solids

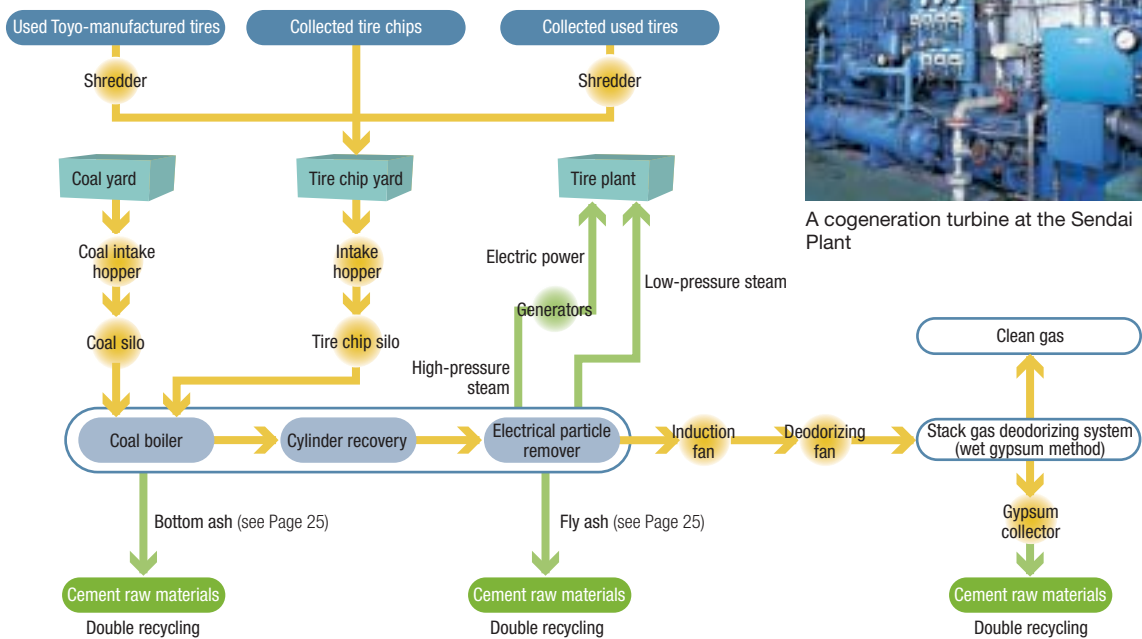
PRTR substances

- Amounts are stated in kilograms (kg) and are rounded to the nearest whole number.
- The unit of measurement for dioxins is mg-TEQ/year (two significant digits)

Cogeneration Facilities at the Sendai Plant

We have developed a cogeneration system in which used tires can be used as fuel instead of coal. In 1990 the Sendai Plant became the first tire factory to install such a system. The Sendai system burns a mixture of coal and tire chips. Its mixed-combustion boiler emits fewer nitrogen oxides (NOx) than conventional coal boilers, while sulfur oxide (SOx) emissions are reduced

through a desulfurization process. This system has attracted considerable interest because of its ability to produce environment-friendly electric power and reduce environmental loads.

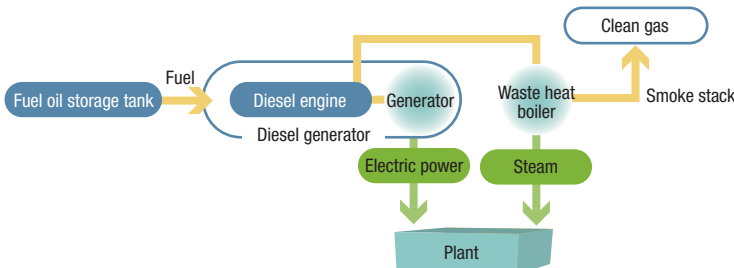


A cogeneration turbine at the Sendai Plant

Cogeneration Facilities at the Kuwana Plant

A diesel cogeneration system configured to burn fuel oil was installed at the Kuwana Plant in 1995. It supplies power to production lines for tires and automotive parts. A second system was installed in 1998. Both systems are used

actively in production operations. Highly efficient diesel engines are used to produce two types of secondary energy—electric power and steam—from fuel oil. This technology is making a major contribution to effective resource utilization.



Cogeneration facilities at the Kuwana Plant

Ayabe Toyo Rubber Co., Ltd.

Location: 115, Sawa, Kuricho, Ayabe City, Kyoto Prefecture
Telephone: 0773-48-0001
Products: Polyurethane products, plastic products
Site area: 38,236m²
Total floor area: 6,031m²
Number of employees: 108



Fukushima Rubber Co., Ltd.

Location: 28, Aza Domaie, Miyashiro, Fukushima City, Fukushima Prefecture
Telephone: 024-553-1356
Products: Automotive parts, water proof sheets and liners, polyurethane products
Site area: 59,420m²
Total floor area: 26,011m²
Number of employees: 285



Air Pollution Measurements (Stack Gas Concentrations)

Facility	SOx (sulfur oxides)		NOx (nitrogen oxides)		Dust	
	Standard	Measured	Standard	Measured	Standard	Measured
No. 1 Boiler	11.5	0.16	—	64	0.30	0.010
No. 2 Boiler	11.5	0.19	—	67	0.30	0.008
No. 3 Boiler	11.5	0.21	—	67	0.30	0.002

Air Pollution Measurements (Stack Gas Concentrations)

Facility	SOx (sulfur oxides)		NOx (nitrogen oxides)		Dust	
	Standard	Measured	Standard	Measured	Standard	Measured
No. 2 Boiler	5.42	0.87	180	89	0.30	0.024
No. 3 Boiler	8.39	1.75	250	130	0.30	0.018
No. 4 Boiler	3.67	0.92	180	93	0.30	0.027
No. 5 Boiler	3.59	0.85	180	120	0.30	0.024
Waste Heat boiler	16.6	0.46	150	120	0.25	0.059

Water Contamination Measurements

Item	Standard	Measured		
		Maximum	Minimum	Average
pH	5.8—8.6	7.3	6.9	7.1
BOD	25	16.0	1.0	7.5
COD	120	44.0	2.0	14.3
SS	90	9.0	2.0	4.3
n-Hex (mineral)	1	<1	<1	<1
Dichloromethane	0.04	<0.01	<0.01	<0.01

Water Contamination Measurements

Item	Standard	Measured		
		Maximum	Minimum	Average
pH	5.8—8.6	8.5	7.1	7.6
BOD	25	18.0	0.6	3.7
COD	40	9.5	2.2	4.0
SS	70	8.0	<0.1	3.4
n-Hex (animals, plants)	10	1.4	<0.5	0.5
Coliform bacteria	3,000	110	0	30.2
Dichloromethane	0.2	<0.02	<0.02	<0.02
Thiram	0.06	<0.005	<0.005	<0.005

PRTR Substances

Official Number	Substance	Amount Released (kg)		Amount Transferred (kg)	
		Atmosphere	Water	Waste	Sewer
120	3,3'-dichloro-4,4'-diaminodiphenylmethane	0	0	0	0
145	Dichloromethane	2,143	0	0	0
272	Bis (2-ethylhexyl) phthalate	635	0	9,117	0

PRTR Substances

Official Number	Substance	Amount Released (kg)		Amount Transferred (kg)	
		Atmosphere	Water	Waste	Sewer
9	Bis (2-ethylhexyl) adipate	0	0	38	0
32	2-imidazolidinethione	0	0	0	0
132	1,1-dichloro-1-fluoroethane; HCFC-141b	2,642	0	3,799	0
172	N,N-dimethylformamide	1,245	0	0	0
204	Tetramethylthiuram disulfide	0	0	0	0
227	Toluene	192,113	0	22,820	0
249	Zinc bis (N,N'-dimethyldithiocarbamate) (ziram)	0	0	0	0
272	Bis (2-ethylhexyl) phthalate	0	0	60	0

Overseas Plants

Cheng Shin-Petrel Tire (Xiamen) Co., Ltd.
(Xiamen, China)

New Pacific Industry Co., Ltd.
(Chuang-Hua, Taiwan)



Cheng Shin-Toyo Tire & Rubber China Co., Ltd.
(Jiangsu Province, China)

GTY Tire Company
(Illinois, U.S.A.)

Toyo Automotive Parts (U.S.A.), Inc.
(Kentucky, U.S.A.)



Toyo Rubber (Malaysia) SDN. BHD.
(Johore, Malaysia)

Toyo Tire & Rubber Australia Limited
(New South Wales, Australia)



Facilities used to ensure compliance with environmental standards



Stack gas treatment system



Wastewater treatment system

Chubu Soflan Co., Ltd.

Location: 3, Aza Syogayama, Oaza Uchikoshi, Miyosicho, Nishikamo-gun, Aichi Prefecture

Telephone: 0561-34-2711

Products: Automotive parts, plastic products

Site area: 31,080m²

Total floor area: 22,415m²

Number of employees: 301



Air Pollution Measurements (Stack Gas Concentrations)

Facility	SOx (sulfur oxides)		Dust		Dioxins	
	Standard	Measured	Standard	Measured	Standard	Measured
No. 1 Boiler	150	75	0.10	0.002		
No. 2 Boiler	150	63	0.10	0.002		
No. 3 Boiler	150	53	0.10	0.002		
No. 4 Boiler	150	77	0.10	0.002		
No. 5 Boiler	150	48	0.10	0.002		
Incinerator (stack gas)	250	97	0.25	0.24	10	1.3
Incinerator (ash)					3	0.01

Water Contamination Measurements

Item	Standard	Measured		
		Maximum	Minimum	Average
pH	5.8-8.6	8	6	6.9
BOD	160	76	2	21
COD	160	87	4	20
SS	200	34	3	11
n-Hex (mineral)	5	5	<0.5	1.3
Nitrogen	120	80	0.3	17.7
Phosphorus	16	8	0.3	1.7
Coliform bacteria	3,000	<30	<30	<30
Dichloromethane	0.2	<0.02	<0.02	<0.02

PRTR Substances

Official Number	Substance	Amount Released (kg)		Amount Transferred (kg)	
		Atmosphere	Water	Waste	Sewer
63	Xylene	23,058	0	0	0
101	2-ethoxyethyl acetate	8,864	0	0	0
145	Dichloromethane	1,009	0	850	0
179	Dioxins	21	0	1.5	0
224	1,3,5-trimethyl benzene	14,509	0	0	0
227	Toluene	37,577	0	0	0
272	Bis (2-ethylhexyl) phthalate	0	0	2,286	0
307	Polyoxyethylene alkyl ether	940	0	180	0
338	m-tolylene diisocyanate	0	0	3,800	0
352	Tris (2-chloroethyl) phosphate	0	0	0	0

T.G.K. Co., Ltd.

Location: 52-1, Furumaya, Sekicho, Suzuka-gun, Mie Prefecture

Telephone: 05959-6-0791

Products: Automotive parts

Site area: 12,538m²

Total floor area: 10,480m²

Number of employees: 230



Water Contamination Measurements

Item	Standard	Measured		
		Maximum	Minimum	Average
pH	5.8-8.6	8.0	7.5	7.7
BOD	25	5.2	1.0	2.3
COD	25	5.9	1.8	3.0
SS	90	12.0	1.0	4.7
n-Hex (mineral)	5	0.6	0	0.4
Nitrogen	25	17.0	6.9	11.8
Phosphorus	2	0.14	0.04	0.08
Thiram	0.06	0	0	0

Toyo Soflan Co., Ltd.

Location: 982, Kaneda, Atsugi City, Kanagawa Prefecture

Telephone: 046-222-4011

Products: Polyurethane foam, automotive parts, plastic products

Site area: 23,890m²

Total floor area: 9,247m²

Number of employees: 232



Air Pollution Measurements (Stack Gas Concentrations)

Facility	SOx (sulfur oxides)		Dust		Dioxins	
	Standard	Measured	Standard	Measured	Standard	Measured
No. 1 Boiler	0.33	0.026	265	17		
No. 2 Boiler	0.22	0.031	176	22		
Incinerator (stack gas)					10	0.014
Incinerator (ash)					3	0.000045

Water Contamination Measurements

Item	Standard	Measured		
		Maximum	Minimum	Average
pH	5.7-8.7	7.9	6.4	6.9
BOD	300	31.0	1.0	11.5
SS	300	4.5	<2.0	2.7
n-Hex (mineral)	5	1.2	<1.0	1.0
Iodine consumption	220	5.4	<1.0	3.0
Dichloromethane	0.2	<0.03	<0.02	<0.02

PRTR Substances

Official Number	Substance	Amount Released (kg)		Amount Transferred (kg)	
		Atmosphere	Water	Waste	Sewer
43	Ethylene glycol	0	0	0	0
44	Ethylene glycol monoethyl ether	0	0	0	0
132*	1,1-dichloro-1-fluoroethane	14,630	0	0	0
145	Dichloromethane	108,509	0	2,400	0
179	Dioxins	0.16	0	0.000016	0
227	Toluene	10,578	0	0	0
230	Lead and lead compounds	0	0	0	0
272	Bis (2-ethylhexyl) phthalate	0	0	0	0
338	m-tolylene diisocyanate	0	0	0	0

*In *Environmental Report 2002* the atmospheric release quantity for substance 132 was erroneously stated as 864,793kg. The correct figure was 15,673kg. The amended figure was submitted to the authorities on June 20, 2003.

PRTR Substances

Official Number	Substance	Amount Released (kg)		Amount Transferred (kg)	
		Atmosphere	Water	Waste	Sewer
1	Water-soluble zinc compounds	0	0	4,073	0
40	Ethylbenzene	755	0	259	0
43	Ethylene glycol	0	0	708	0
44	Ethylene glycol monoethyl ether	3,530	0	119	0
63	Xylene	57,721	0	24,673	0
101	2-ethoxyethyl acetate	7,059	0	238	0
115	N-cyclohexyl-2-benzothiazolesulfenamide	0	0	72	0
227	Toluene	26,947	0	17,909	0

Akashi Plant, Hyogo Manufacturing Complex

Location: Rokubuichi 1183, Inamicho, Kako-gun, Hyogo Prefecture

Telephone: 0794-95-1421

Products: Industrial rubber, polyurethane products, automotive parts

Site area: 84,240m²

Total floor area: 15,459 m²

Number of employees: 473



Air Pollution Measurements (Stack Gas Concentrations)

Facility	SOx (sulfur oxides)		NOx (nitrogen oxides)		Dust	
	Standard	Measured	Standard	Measured	Standard	Measured
No. 1 Boiler	3.5	0.26	250	140	0.30	0.010
No. 2 Boiler	3.5	0.21	250	130	0.30	0.097
No. 3 Boiler	1.75	0.02	250	54	0.30	0.001
No. 4 Boiler	1.75	0.01	180	36	0.30	0.001
No. 5 Boiler	1.75	0.01	180	62	0.30	0.002

Water Contamination Measurements

Item	Standard	Measured		
		Maximum	Minimum	Average
pH	5.0-9.0	7.6	7.2	7.4
BOD	100	9.1	0.6	3.8
COD	100	7.7	3.3	5.4
SS	90	9.2	1.6	3.8
n-Hex (animals, plants)	20	1.7	0.5	1.0
Nitrogen	120	10.0	2.8	6.3
Phosphorus	16	0.89	0.23	0.56
Coliform bacteria	3,000	2,100	5	419
Dichloromethane	0.2	<0.002	<0.002	<0.002

PRTR Substances

Official Number	Substance	Amount Released (kg)		Amount Transferred (kg)	
		Atmosphere	Water	Waste	Sewer
43	Ethylene glycol	0	0	0	0
63	Xylene	4,787	0	0	0
120	3,3'-dichloro-4,4'-diaminodiphenylmethane	0	0	0	0
132	1,1-dichloro-1-fluoroethane	36,137	0	0	0
145	Dichloromethane	2,200	0	23	0
172	N,N-dimethylformamide	15	0	1,496	0
177	Styrene	0	0	0	0
227	Toluene	22,441	0	0	0
230	Lead and lead compounds	0	0	0	0
270	Di-n-butyl phthalate	0	0	0	0
272	Bis (2-ethylhexyl) phthalate	0	0	0	0
338	m-tolylene diisocyanate	0	0	0	0

Hyogo Plant, Hyogo Manufacturing Complex

Location: Rokubuichi 1176, Inamicho, Kako-gun, Hyogo Prefecture

Telephone: 0794-92-2222

Products: Polyurethane products, automotive parts, plastic products

Site area: 49,127m²

Total floor area: 15,095m²

Number of employees: 273



Air Pollution Measurements (Stack Gas Concentrations)

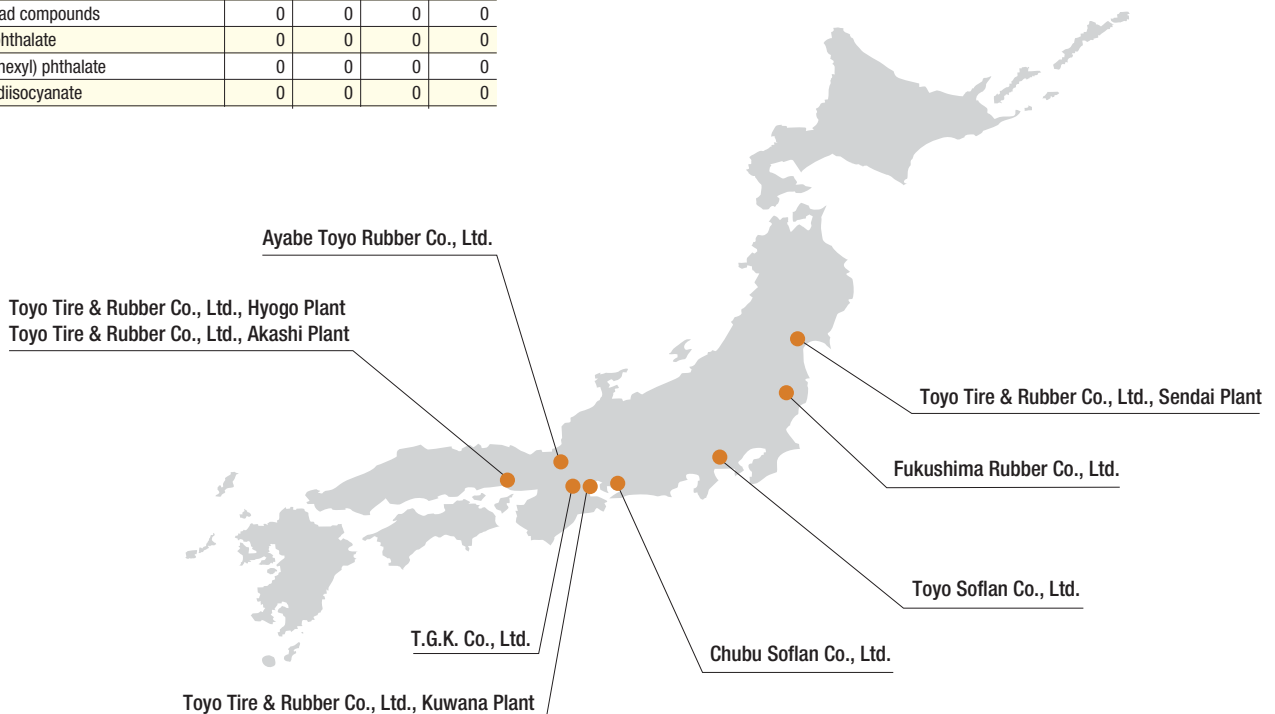
Facility	SOx (sulfur oxides)		NOx (nitrogen oxides)		Dust	
	Standard	Measured	Standard	Measured	Standard	Measured
No. 1 Boiler	1.75	0.17	180	100	0.30	0.001
No. 2 Boiler	1.75	0.09	180	71	0.30	0.001
No. 3 Boiler	1.75	0.11	180	47	0.30	0.008

Water Contamination Measurements

Item	Standard	Measured		
		Maximum	Minimum	Average
pH	5.0-9.0	8.9	7.3	8.1
BOD	100	46.0	0.6	23.3
COD	100	50.0	1.9	26.0
SS	90	16.0	0.5	8.3
n-Hex (animals, plants)	20	4.5	0.5	2.5
Nitrogen	120	74.0	0.8	37.4
Phosphorus	16	5.7	0.1	2.9

PRTR Substances

Official Number	Substance	Amount Released (kg)		Amount Transferred (kg)	
		Atmosphere	Water	Waste	Sewer
25	Antimony and its compounds	0	0	0	0
43	Ethylene glycol	0	0	0	0
145	Dichloromethane	112,153	0	14,735	0
172	N,N-dimethylformamide	11	0	1,049	0
272	Bis (2-ethylhexyl) phthalate	0	0	0	0
338	m-tolylene diisocyanate	0	0	7,942	0
352	Tris (2-chloroethyl) phosphate	0	0	0	0



A Timeline of Environmental Initiatives by the Toyo Tire & Rubber Group

Environment Activities of the Toyo Group

- 1972** • Corporate Environment Improvement Committee established
- 1975** • Chemical recycling plant for rigid polyurethane foam becomes operational.
- 1989** • CFC Task Force established.
- 1990** • Japan's first cogeneration system fueled partially by used tires becomes operational at the Sendai Plant.
- 1992** • Corporate Environment Improvement Committee restructured as Corporate Environmental Affairs Committee
 - Toyo Global Environmental Charter adopted
 - Toyo Environmental Protection Fund established
 - Flexible polyurethane foam recycling business established
- 1993** • Toyo Global Environmental Action Plan established
 - Environmental Management Department (now the Corporate Staff Center, Environmental Preservation and Occupational Health & Safety Group) established
- 1995** • Letter of appreciation received from the United Nations Environmental Programme (UNEP) for assistance in formulation of policy proposals for the Seventh Meeting of the Parties to the Montreal Protocol
 - Total elimination of CFCs from rigid polyurethane foaming process
 - Participation in the "Eco-Vehicle Project" initiated by the Environment Agency, development of ultra-lightweight tires for electric vehicles
- 1997** • Environmental Management Office (previously the Environmental Management Department) renamed as Environmental Preservation and Occupational Health & Safety Promotion Office
 - Corporate Environmental Affairs Committee dissolved, Environmental Preservation and Occupational Health & Safety Committee established
 - System allowing 100% recycling of dust implemented at the Sendai Plant
- 1998** • "Minister of International Trade and Industry Award" presented to the Sendai Plant by the Recycling Promotion Council (for a cogeneration system designed to use waste tires as fuel)
 - Technology established for the production of rigid polyurethane using 100% water-blown foaming
- 1999** • Introduction of environmental accounting system.
- 2000** • ISO14001 accreditation achieved at the Group's eight domestic manufacturing sites
 - 20% reduction in rolling resistance of tires
 - Environmental Preservation and Occupational Health & Safety Promotion Office renamed as the Environmental Preservation and Occupational Health & Safety Group
- 2001** • 10% reduction in tire weight and a 20% improvement in wear resistance (both relative to FY1990 levels)
 - Hyogo Manufacturing Complex selected for Hyogo Prefecture's "Environmentally Friendly Business Operator Award"
 - Toyo Group's polyurethane water-blown foaming technology selected for the "Special Jurors' Award" at the "Ozone Layer Protection Awards" presentation, sponsored by The Nikkan Kogyo Shimbun newspaper
 - "First Environmental Technology Award" of the Kinki Chemical Society, Japan awarded to Toyo for its development of chemical recycling technology for rigid polyurethane foam
 - Letter of appreciation received from the Osaka Community Foundation for the contribution made through the Environmental Protection Fund.
 - Osaka Prefecture's "Osaka Environmental Award" received in recognition of the contribution made through the Environmental Protection Fund
 - Group-wide implementation of 5S activities
- 2002** • Technical Research Center selected by Osaka Prefectural Government for the President's Award of the Japan Association for Safety of Hazardous Materials
 - Toyo Technical Center (main building) selected as the Kinki Block winner of the 15th "Nikkei New Office Award" sponsored by the Nihon Keizai Shinbun newspaper
 - New plant completed by Toyo Automotive Parts (U.S.A.) Inc.
 - Grants through the Toyo Environmental Protection Fund exceed ¥100 million.

Major Environmental Developments in Japan and Overseas

- 1968** • Air Pollution Control Law established
- 1970** • Waste Management Law established
 - Water Pollution Control Law established
- 1972** • Occupational Safety and Health Law established
- 1973** • Law Concerning the Examination and Regulation of Manufacture, etc., of Chemical Substances established
- 1989** • Law Concerning the Protection of the Ozone Layer through the Control of Specified Substances and Other Measures promulgated
 - Basel Convention on the Transboundary Movement of Hazardous Wastes adopted
- 1990** • Law Concerning Prevention of Dust from Spiked Tires promulgated
- 1992** • Agenda 21 adopted at United Nations Conference on Environment and Development (UNCED), Rio de Janeiro (Earth Summit)
 - Automobile NOx Law established
- 1993** • Decision by International Organization for Standardization (ISO) to establish technical committee on environmental management
 - Basic Law on the Environment established
- 1995** • Containers and Packaging Recycling Law
- 1996** • ISO14001 established
- 1997** • Third Conference of the Parties to the United Nations Framework Convention on Climate Change (COP3) held in Kyoto
- 1998** • COP4
 - Law for Recycling of Specified Kinds of Home Appliances established
- 1999** • COP5
 - Environmental Impact Assessment Law established
 - Law Concerning Special Measures against Dioxins established
 - PRTR Law established
- 2000** • COP6
 - Basic Law for Establishing the Recycling-based Society established
 - Law on Promoting Green Purchasing established
 - Food Recycling Law established
 - Construction Materials Recycling Act
- 2001** • COP6 reconvened
 - COP7
 - Vehicle NOx/PM Regulation Law established
 - Law Concerning Special Measures for Promoting Appropriate Disposal of Waste Containing Polychlorinated Biphenyl (PCB) established
- 2002** • Soil Contamination Countermeasures Law established
 - Automobile Recycling Law established
 - Ratification of Amended Montreal Protocol on Substances that Deplete the Ozone Layer

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