NITTO DENKO CORPORATION

Head Office
1-1-2 Shimohozumi Ibaraki Osaka

Enquiries
Environmental Technology Development Department
18 Hirayama Nakahara Toyohashi Aichi 441-3194
http://www.nitto.com./
Tel: 81-532-43-1804, Fax: 81-532-43-1879

Published August 2002

NITTO DENKO

For a Better Global Environment

Environmental Report

2002

NITTO DENKO CORPORATION

Contents

Nitto Denko Environmental Report

1998 Version

1999 Version

2000 Version

2001 Version

Editing policy for an environmental report

We changed our editing policy when preparing this year's environmental report. Based on reports published by other companies, our philosophy up to last year has been to include as much information as possible to compile a more comprehensive document. We however discovered that this made the document so large that it obscured the Nitto Denko Group's "philosophy of environmental management" and the "environmental activities of the fiscal year." As an experiment, we have therefore decided to edit the contents as follows:

1. Clearly state the impact the Nitto Denko Group's business and business activities have on the environment and report what we are doing to reduce impact on the environment at the manufacturing stage.
2. Report activities based on trend of the times when the report is published.
For example, this year's report takes up our "initiatives with PRTR."
3. Introduce the Nitto Denko Group's original and advanced activities.

We also have decided to post primarily the technical details on our Web site to reduce the amount of paper used for the report while still providing a complete description of our activities.

Tetsuo Horiuchi
Director and General Manager of Environmental Technology Development Department

●Applicable period
April 1, 2001 – March 31, 2002

●Scope
Material flow,Voluntary plan
PRTR data: 7 domestic Nitto Denko plants
Environmental accounting:
Nitto Denko Corp. and 5 domestic Nitto Denko Group companies

●Next scheduled publication: June 2003

Company Profile

Company name: Nitto Denko Corp.
Established: October 25, 1918
Head Office: 1-1-2 Shimohozumi Ibaraki, Osaka
Capital: ¥26.783 billion (as of March 31, 2002)
No. of employees: 2,984(as of March 31, 2002)
Consolidated sales: ¥338.930 billion (fiscal 2001)
Non-consolidated sales: ¥195.456 billion (fiscal 2001)

Coping with Environmental Problems while being Open, Fair and Best

The organisms living on the Earth crawled up on land from the primeval sea, and evolved in various ways to adapt to changes in the environment. The twentieth century, which was supposed to have given us a more abundant lifestyle, however has had an excessive impact on the environment and has placed animals that have managed to survive from times immemorial on the brink of extinction. As individuals, we must think of "harmony with the environment" as indispensable for our corporate activities.

At Nitto Denko, we have established an environmental budget, and in fiscal 2001, we achieved our targets for reduction of volume of industrial waste discarded and amount of organic solvents discharged into the environment a year ahead of schedule, enabling us to revise our targets upward.
We lead all other companies in introducing flow cost accounting as a method of assessing environmental accounting by tying it into countermeasures and results. We promise to continue to practice "environmental management" based on the slogan "from dealing with that problem at its destination to dealing with that problem at its source."

All of our operations are open to the public, decided fairly, and the best is incorporated into the conclusion. We therefore work on environmental problems in the spirit of "Open, Fair and Best." We ask all of you for your advice and guidance along with your understanding of the environmental activities of the Nitto Denko Group.

Masamichi Takemoto
President

Basic Attitude Concerning Conservation of the Environment

Corporate Environmental Policy

In keeping with the corporate concept of “harmony with nature” and “conserving natural resources to protect the natural environment” as the standard of our actions, the Nitto Denko Group considers environmental conservation to be a part of management. Based on the corporate environmental policy established by the company in 1996, our activities aim to achieve “environmental management” that supports both resource productivity and corporate growth.

Environmental Management

The Nitto Denko Group established the management concept of “creation of new value” in 1993 and “employee guidelines” as a guideline for daily corporate activities to achieve this. By continuing to provide customers with new value, we plan for healthy growth as a company and aim to be a company with existing value with the company, stockholders and employees all having a stake in the operations.
Based on these employee guidelines, we have established a policy for realizing product safety and environmental safety on which customer satisfaction is based. Concerning environmental conservation, the Voluntary Plan (environmental conservation activities plan) was established in 1993.
TheCorporate Environmental Policy was established and revealed to the public in 1996. The environmental policy was translated into English and overseas companies belonging to the Nitto Denko Group were informed of the policy as well.

Since the 1960s, the Nitto Denko Group has promoted dealing with that problem at its destination such as installation of solvent recovery units and deodorizing furnaces (equipment for incinerating solvents) primarily to prevent air pollution caused by organic solvents. We are currently switching from emphasis on dealing with that problem at its destination to source countermeasure and process reform such as manufacturing metho ds that do not use organic solvents or produce waste. We therefore hope to contribute to make a social contrbution by pursuing our business activities with respect for the environment through research and developpment and manufacturing technology development rather than just pursuing environmental conserrvation alone.

Corporate Vision

Creating New Value

- Creating functional products that satisfy customers.
- Respecting the individuality of all employees and enabling them to achieve personal fulfillment throught their work.
- **Respecting the environment and contributing the global community.**

Employee Guidelines

- Remenber that our customers deserve exceptional product quality and outstanding service.
- Always put safety first.
- Approach every task with motivation and diligence.
- Use ethics and the law as your guides.
- **Strive to protect the environment and conserve natural resources.**

CORPORATE ENVIRONMENTAL POLICY

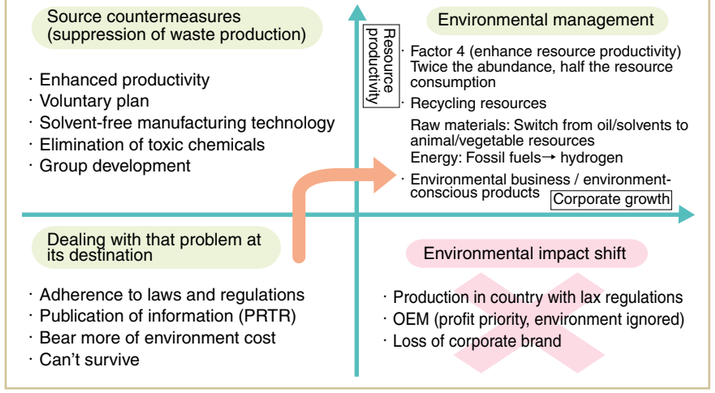
Philosophy

At the Nitto Denko Group, we recognize the maintaining the health of the earth for coming gener- ations requires that humanity seriously address the issue of global environmental conservation. Consequently, the Nitto Denko Group, through its adoptions of the corporate vision “Creating new value,” is committed to respecting and acting in the best interests of the environment, both locally and globally, in all its operations.

Environmental Policies

1. We will develop an internal environmental management system that promotes effective environmental preservation.
2. With a proper understanding of the environmental impact of our operatons, we will develop internal environmental objective and targets as far as is technically and economically practicable; moreover, we will pursue these objectives and targets in an organized manner to ensue the continual improvement of our environmental preservation efforts.
3. Our technical and product development will focus on the reduction of environmental load.
4. We will continue our efforts to conserve resources and energy, reduce industrial waste, and promote recycling in all aspects of our operations.
5. As part of our dedication to reducing the load on the environment, we will develop alternative technologies intended to reduce consumption of the sources of environmental pollution as well as to control emissions of environmental pollutants to the greatest extent feasible.
6. We will comply fully with environmental laws, regulations and agreements, and will impose our own environmental criteria as required in the interests of environmental preservation.
7. We will make sure that our enployees receive environmental training and information so that all understand the significance of our Corporate Environmental Policy, have increased awareness of the importance of environmental preservation, and act on our Corporate Environmental Policy.
8. We will conduct periodic environmental audits in order to monitor the effectiveness of our environmental management strategy and identify areas requiring improvement.
9. As part of our social contribution, we will publicize proprietary technologies and information that are likely to benefit the environment.

Environmental management aimed for by Nitto Denko Group



Environmental Strategy and Results of Main Activities for Fiscal 2001

The Nitto Denko Group has established an environmental strategy to realize “environmental management,” of which main activities are decided for each fiscal year, and the entire group works as a unit primarily through the environment committee.

Environmental strategy concept and measures

Constructing a recycling society for sustainable development is as social proposition and is also the proposition of the Nitto Denko Group. As part of the intermediate plan for the environment, we have therefore drawn the “ideal form” and have propose and environmental strategy for building a recycling society. Based on this environmental strategy, we clearly state problems concerning each measure, assign a priority ranking, decide the activities for each fiscal year and follow the results.

Main activities of fiscal 2001

The main activities of fiscal 2001 and their results are as follows:

1) Revision of voluntary plan targets
- Targets for reduction of industrial waste revised upward.

2) Chemical substance management
- Nitto Denko voluntary chemical management guidelines established for 1,711 substances to be prohibited, reduced or controlled. Applied to new products since September
- Chemical management system begun to be implemented at Nitto Denko headquarters.

3) LCA
- Standards for assessing environment-conscious products established.

4) Establishment of Green procurement guidelines
- Prepared by Materials Department and Environmental Technology Development Department and distributed to business partners. Posted on Nitto Denko Web site.

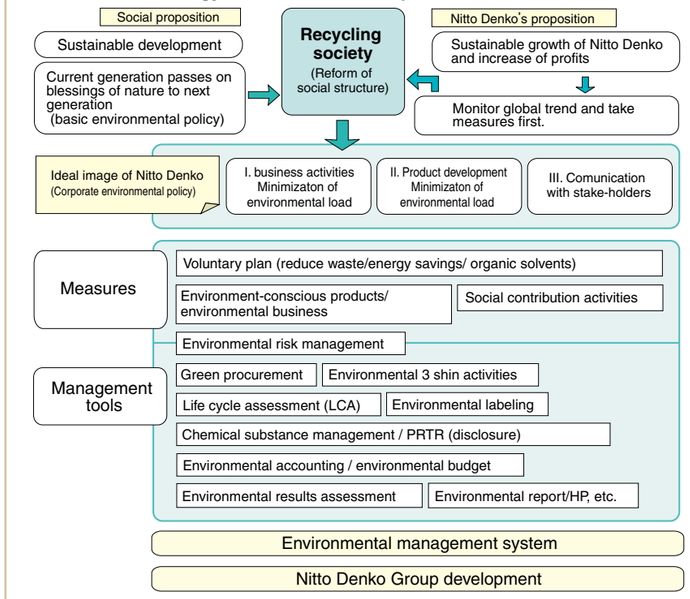
5) Publication of environmental report (fiscal 2001 version)
- Environmental report published in June. English version also posted on Web site.

6) Environmental accounting / environmental budget
- Carried out at all domestic Nitto Denko Group companies beginning the current fiscal year. Fiscal 2002 environmental budget drawn up including overseas Nitto Denko Group companies.

7) Integrated internal environmental audit
- Carried out at 8 plants according to plan.

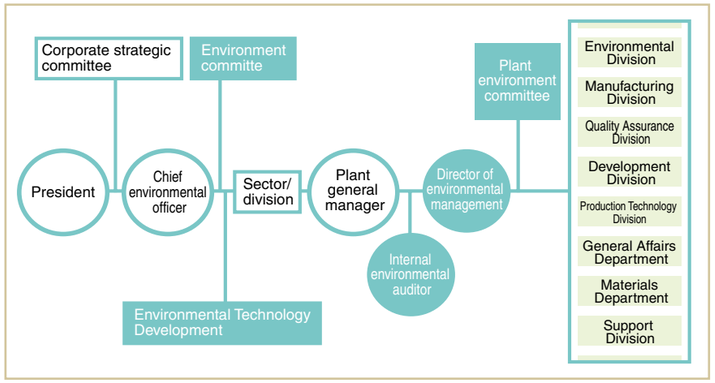
8) Establishment of award system for reduction of industrial waste
- Value of industrical waste reduction award (1% of effect amount awarded) and Award for waste-free plant established.

Environmental strategy of Nitto Denko Group



Group promotion system

The “environment committee” that meets twice a year is the Nitto Denko Group’s highest deliberative organization. The matters decided by the committee are passed on to all plants. In domestic manufacturing plants, the plant general manager is in charge of environmental matters. Each plant has its own environment committee, director of environmental management, and internal environmental auditor. Environmental management suitable for the plant is constructed, implemented, maintained and improved and environment conservation activities are carried out based on the respective policies.



Nitto Denko Group's Relationship with the Environment

Business Characteristics and Main Environmental Load

The Nitto Denko Group provides products throughout the world by producing materials and sub-parts used in cars, housing, home electronics, OA equipment and IT through technologies for applying, processing and synthesizing high polymer materials. The impact of the Nitto Denko Group's business activities on the environment includes the following: (1) Oil resources account for much of the production resources, (2) Materials and sub-parts are fated to dispose when end products are no longer necessary, (3) the tape manufacturing process, which is one of the mainstay businesses, uses a lot of organic solvents.

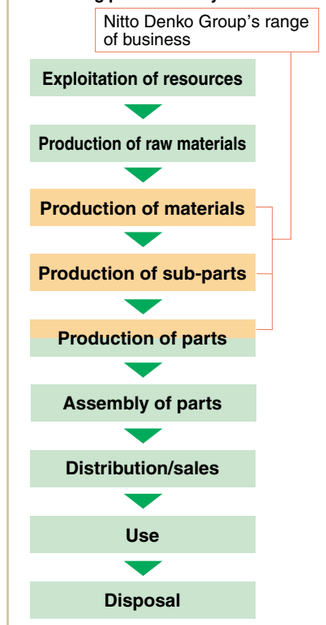
Produces adhesive tape, materials and parts. -The Nitto Denko Group's products

Beginning with electronic component materials and adhesive tape, the Nitto Denko Group's products are used for various applications including for example optical film for car navigation systems, flexible printed circuits for car stereo systems and double coated adhesive tape for fastening emblems for the field of automobiles for which performance is constantly improving. Our sealing material and reinforcing and vibration damping materials with flame and weather resist ance that contribute to reducing body weight and improving fuel efficiency and comfort are used in many places.

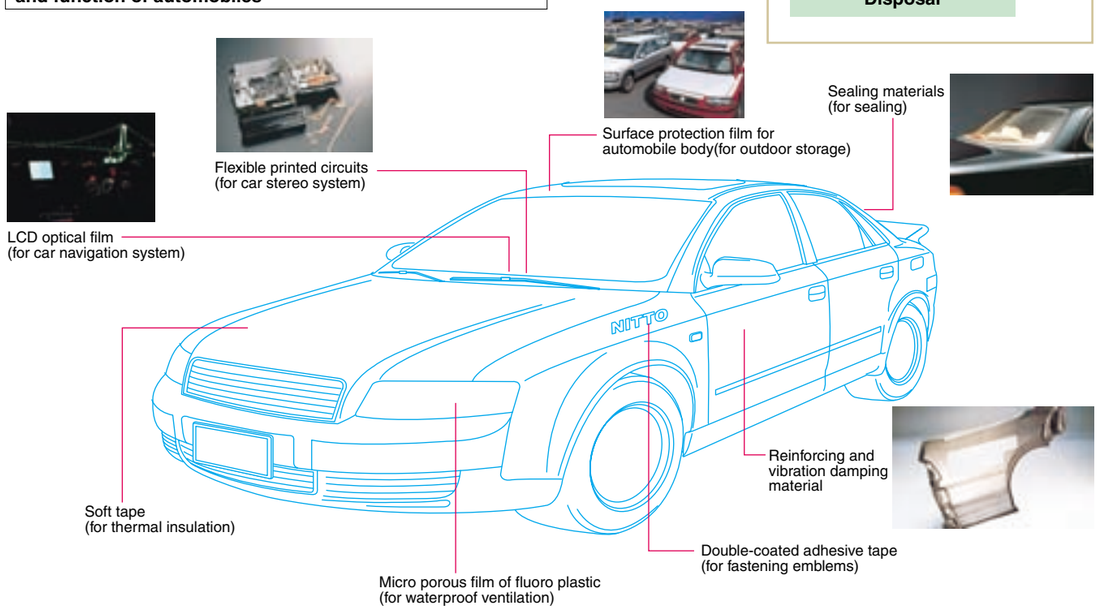
Size of environmental load is a problem when manufacturing. -Environmental aspects of product

The Nitto Denko Group produces sub-parts and materials for parts makers and assemblers. We offer custom machining to respond to various customer demands. Loss of energy and materials occurs as a result. At the current point in time, that is the cause of environmental load generated by the Nitto Denko Group's business activities. Reduction of environmental load when manufacturing is a theme for the Nitto Denko Group.

Nitto Denko Group's range of business concerning product life cycle



Main products of Nitto Denko Group for supporting comfort and function of automobiles

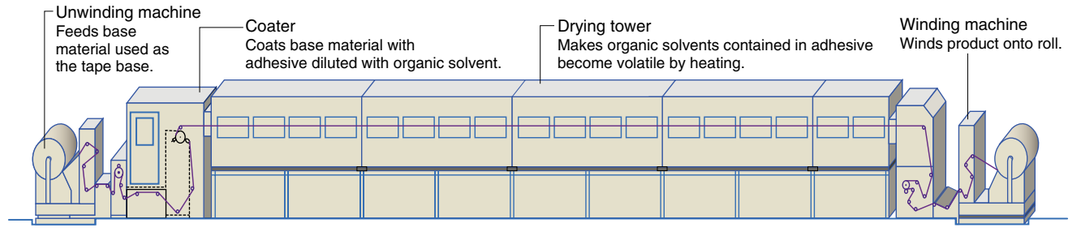


Prevention of air pollution, energy savings and reduction of waste are main themes. -Environmental themes of the Nitto Denko Group

The manufacturing process for adhesive tape, which is one of the mainstay businesses of the Nitto Denko Group, is as follows. The environmental load of this process always includes organic solvents. Organic solvents are used to dilute adhesive for uniform application on base material. The solvents are made volatile by the closed-type drying tower after coating, and are processed by the solvent recovery unit and deodorizing unit. The drying tower, solvent recovery unit and deodorizer consume a large quantity of energy and discharge CO_2. Leftover portions of products cut to the size which reproducts that do not pass the inspection test are disposed of as waste. Reducing this waste is also an important theme for environmental activities.

Detailed contents of environmental efforts for business activities are given on pages 9 -14.

Manufacturing process of adhesive tape



Promotes environment-conscious products according to needs. -Efforts with product development

Environmental EU directives and related laws for promoting formation of a recycling society have been implemented, and as customers become more interested in environment-consciousness of products, the Nitto Denko Group defines environment-conscious products from four points of view in order to develop and expand. When developing individual products, before starting and when shifting to production (2 times), environment-consciousness is quantitatively assessed in accordance with 8 standards for assessing environment-consciousness of products. While adopting the concept of LCA, we aim to reduce environmental load of products and improve resource productivity.

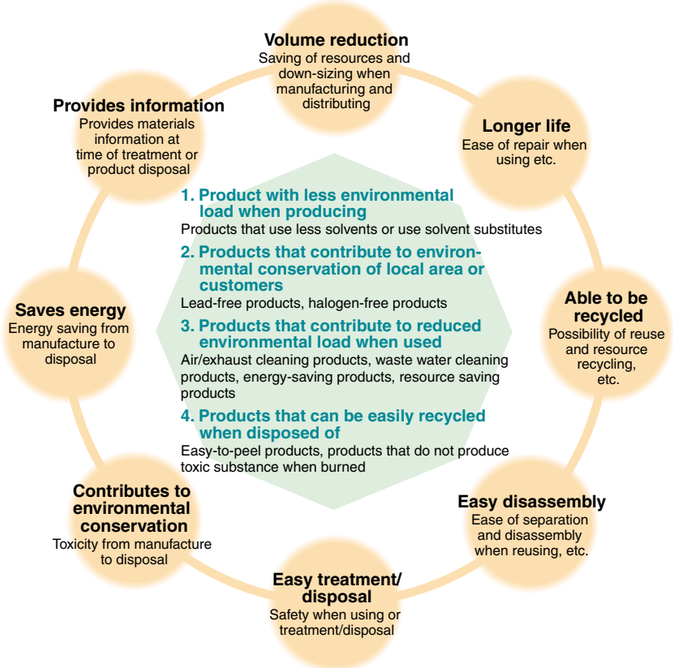
Main examples of environment-conscious products are given on page 7.

Structure of environment-conscious product assessment

	Existing product	Primary	Secondary
Volume reduction	2	2.2	2.3
Longer life	2	3	4
Able to be recycled	2	3	4
Easy disassembly	2	2	2
Easy treatment/disposal	2	2.8	3
Contributes to environmental conservation	2	3	3.3
Saves energy	2	3	5
Provides information	2	2	2
Average points	2	2.6	3.2

Each item is assesses with a perfect score of 5 points, with the existing product being 2 points. Any product with 2 or points for any item, or a total aver- age of 2.5 points or more is certified as an environment-conscious product. The assessment is carried out in 2 stages, primary (before starting development) and secondary (when shifting to production).

Definition of and assessment standards for environment-conscious products



Nitto Denko Group's Relationship with the Environment

Main Environment-conscious Products

By providing many products that reduce environmental load to a wide range of industrial fields, the Nitto Denko Group has contributed to reduction of environmental load of society in general. Here we introduce a brief description of representative environment-conscious products.

1. Product with little environmental load when producing

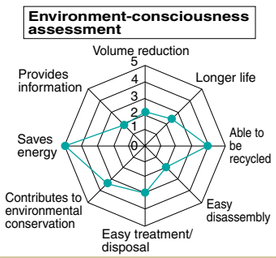
[Resource saving]

Certified eco-mark product using recycled resources

◆Kraft packaging tape "No. 7101 Series"

·Base material contains more than 40% recycled paper
Recycled paper of 40% or more used paper used for adhesive tape base material.

·Uses solvent-free adhesive.
Adopts hot melt adhesive that does not use solvent, so the tape has little environmental load when being manufactured or when being disposed of.



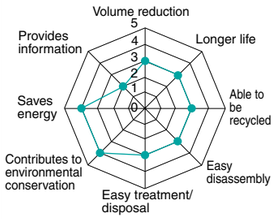
2. Products that contribute to environmental conservation of local area or customers

[Energy saving]

Changes sea water to drinking water.

◆Ultra low pressure reverse osmosis membrane (RO) element "ES Series"

·High energy saving filter membrane
Realizes 99.7% salinity blocking at 0.5 – 0.6 MPa low pressure operation. Offers efficient water desalination using 50% less energy. Used for desalination of brackish water, manufacture of ultra pure water for semiconductor manufacturing, manufacture of germ free water for medical use, and various types of separation, purification and concentration systems.



3. Products that contribute to reduced environmental load when used

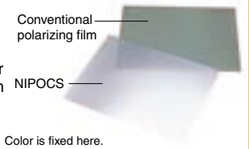
[Energy saving]

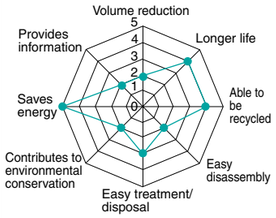
Enhances brightness of liquid crystal displays and contributes to energy saving

◆Polarization converting system (NIPOCS)
["Fiscal 1999 Nikkei Excellent Product/Service Award, Excellence Award, Nikkei Sangyo Shimbun Award" received]

·50% better screen brightness
By applying to LCD if personal computers and cellular telephones, screen brightness is improved 50 - 60%.

·For equipment energy saving
Conventional polarizing film wastes 50% of light from the light source. NIPOCS distorts the direction of the light so it can be reused when re- flected by a reflector of the light source. Extends battery life by 30% while maintaining the same screen brightness as conventional polarizing film.





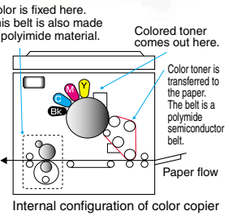
[Energy saving]

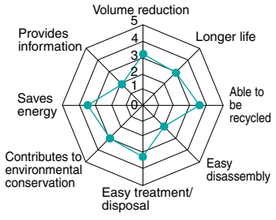
Reduces heat load of heater and improves energy saving

◆Polyimide belt for copier
["Fiscal 2001 Nikkei Excellent Product/Service Award, Superior Award,Nikkei Sangyo Shimbun Award" received]

·Reduces heat load of heater.
Polyimide belts have less heat capacity than metal belts. By using for fixing roll material of copiers heating load of the heater can be reduced. Contributes to energy saving.

·Enables lightweight, compact design.
Enables more compact, lighter weight design than metal rolls.





4. Products that can be easily recycled when disposed of

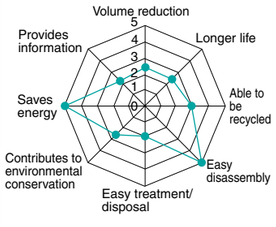
[Facilitates recycling (easy disassembly)]

Can be peeled off without tearing or leaving residue.

◆Recyclable, reusable double-coated adhesive tape "No. 5000NS"

·Facilitates disassembly and recycling of household appliances and OA equipment.
The Household Electrical Appliance Law (went into effect April 2001) requires televisions and air conditioners be easy to disassemble to facilitate recycling. No. 5000NS peels off cleanly to facilitate disassembly.

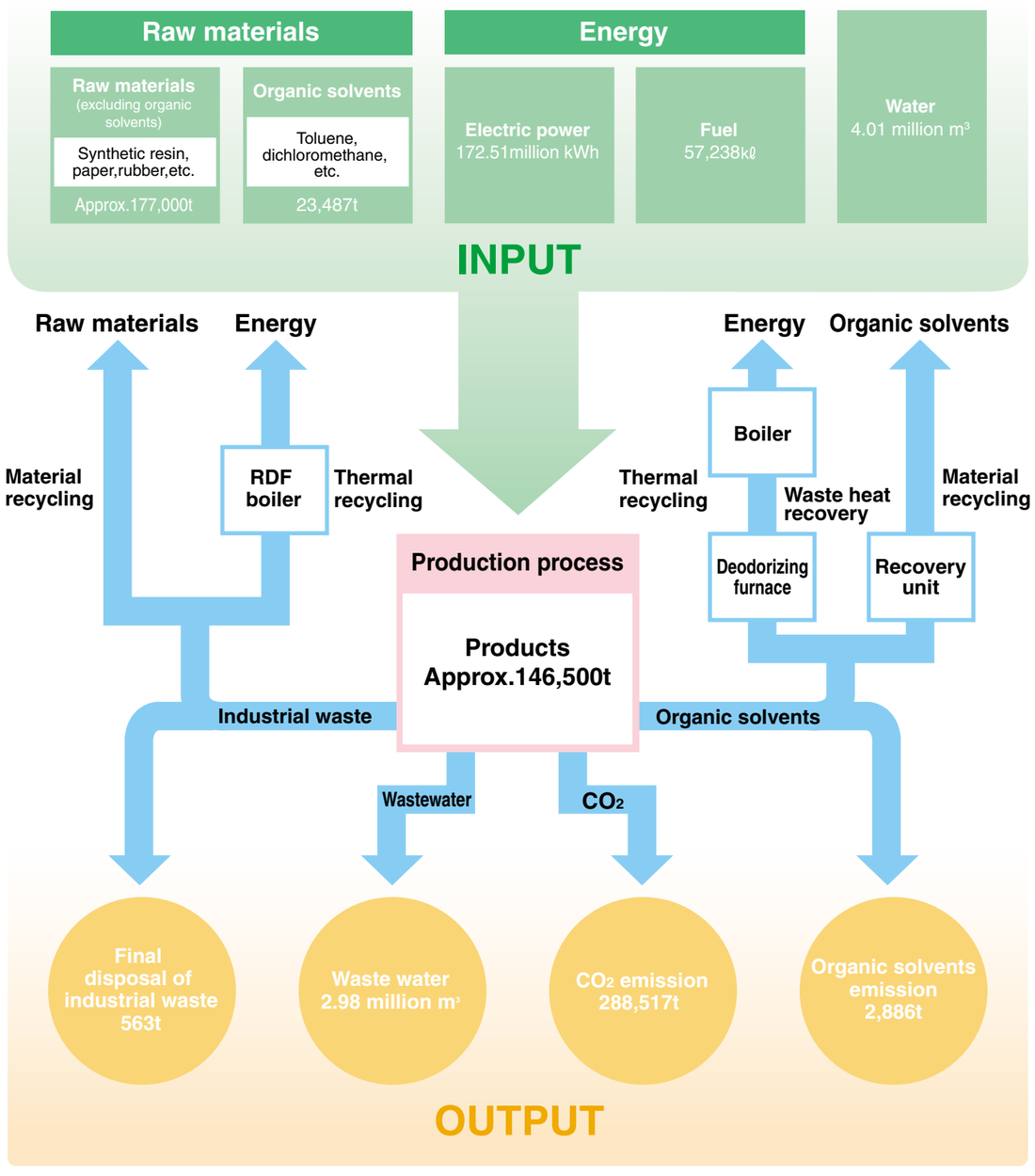
·Doesn't tear or leave residue
Adopts strong nonwoven cloth for base material and special adhesive to enable proper recycling without leaving adhesive or base material on parts.



Impact of Production Activities on the Environment

CO_2, one of the environmental load of Nitto Denko, is mainly generated by consumption of energy. The rest is caused by deodorizing furnaces and thermal recycling of waste. The majority of organic solvents produced by the manufacturing process are treated by deodorizing furnaces and solvent recovery units, but a small amount is discharged into the atmosphere. Final disposal volume of the wastes are taken care of mainly by thermal recycling.

Fiscal 2001 material flow



Environmental Activities of Fiscal 2001

Nitto Denko Environmental Conservation Activities Plan (Voluntary Plan)

"The environment outlining its plans for environmental conservation (Voluntary Plan)" drawn up in 1993 serves as the guideline for specifically promoting environmental conservation activities. All plants and divisions are continuing their efforts in accordance with the plan.

Achievement of Fiscal 2001 Voluntary Plan

Results of Voluntary Plan 1 "reduction of industrial waste" and 3 "prevention of air pollution" were just about satisfactory, but unfortunately it appears that it will be difficult to achieve the targets for "prevention of global warming." Along with continuing to reduce consumption of energy per product unit, we will continue to work on reducing value of industrial waste ratio and amount of solvents used.

Voluntary Plan		Targets/achievement
1	**To reduce waste** Waste caused in connection with production activities does not only involve waste of resources, but problems with disposal as well. Along with promoting reduction of industrial waste by improving yield, we are also working on recycling industrial waste. Related article on page 10	Recycling rate: 98% or more by the end of fiscal 2002 Value of industrial waste ratio* (compared with fiscal 2000): 2-point reduction in fiscal 2002, 5 point reduction in fiscal 2005 For recycle rate, an aim that can achieve the target is established, and we try to clear the fiscal 2002 targets concerning value of industrial waste ratio as well. *Value of industrial waste ratio = (material cost and treatment cost of industrial waste) / Product amount × 100
2	**To prevent global warming** CO_2 (carbon dioxide) is increased by burning fossil fuels, thereby causing global warming. We promote energy saving to improve consumption of energy per product unit, and aim for reduction of CO_2 emission. *Consumption of energy per product unit: Amount of fuel and electric power used converted to crude oil is called "consumption of energy." "Consumption of energy per product unit" is amount of energy used per product unit. Related article on page 11	Consumption of energy per product unit (compared with 1990): 20% improvement by fiscal 2002 As of 2001, results for consumption of energy per product unit concerning targets have not improved. The reason for this could be a reduction of product unit due to production and price reduction due to economic recession and lack of energy saving measures at some plants.
3	**For prevention of air pollution** A lot of organic solvents are used for manufacturing adhesive tape, which is our mainstay business. When organic solvents volatize into the atmosphere they cause photochemical oxidants and are also said to be a remote cause of acid rain and global warming. We are actively involved in reducing the amount of organic solvents released into the atmosphere. Related article on page 12	Organic solvent emission volume (compared with 1998): 50% reduction by fiscal 2002 Reduction of organic solvent emission has been proceeding smoothly and it appears that targets will be achieved. We will also reduce the amount of solvents used by making solvent-free adhesive tape.
4	**International standards for environmental protection** We have obtained ISO 14001 certification, which as an international standard for environmental conservation, at our domestic plants. We are also working on obtaining certification for the entire Nitto Denko Group, and are working on reducing environmental load based on an environmental management system.	Our domestic production bases are continuing to improve environmental management by applying ISO 14001 and are working on introducing (obtaining and continuing certification) of ISO 14001 at our overseas manufacturing bases as well.
5	**Aiming for global activities** Overseas Nitto Denko Group companies are also working for environmental conservation just like the domestic companies.	We are carrying out environmental conservation on the same level as for domestic companies based on "10 environmental matters to be considered for overseas business expansion" indicated by Keidanren in the "Global Environment Charter."

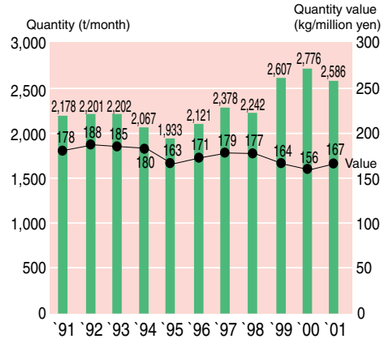
Initiatives for Reducing Waste

Nitto U-tech Corp. was established in 1992. As a result of carrying out material recycling and thermal recycling (using industrial waste as fuel) of waste, the amount of industrial waste discarded was dramatically reduced, and fiscal 2002 targets were cleared in fiscal 2000. Targets were therefore revised upward in 2001. Elimination of waste discharge was achieved at our Toyohashi plant in March 2001, followed by our Kanto plant and Shiga plant in fiscal 2001. We are now planning to achieve this at all Nitto Denko Group companies.

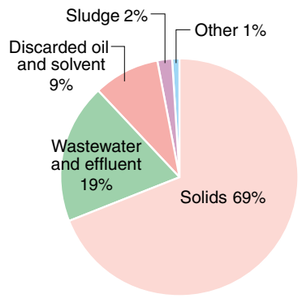
Amount of industrial wastes

The amount of industrial wastes decreased slightly compared with the previous year due to production decline because of economic recession. There has however been an increase in amount of industrial wastes generated per product unit, which is a theme for the future.

Amount of industrial wastes



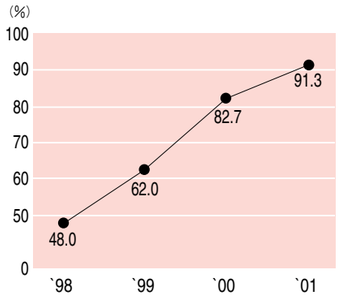
Breakdown of amount of industrial wastes



Recycling of industrial waste

Industrial waste generated in the manufacturing process is thoroughly sorted and recycled. The recycling rate for all Nitto Denko Group companies has been improved to 91.3%. It appears we will achieve 98% of the target value by the end of fiscal 2002.

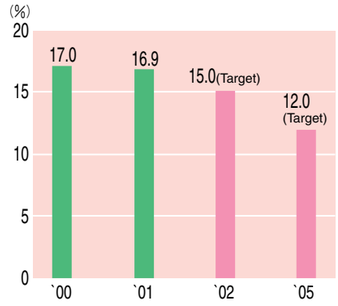
Recycling rate



Reduction of value of industrial waste ratio

To suppress generation of industrial waste at the source, value of industrial waste ratio has been established as a control index for percentage of product unit accounted for by material/processing cost of industrial waste.
This value is linked with environmental accounting, and helps promote environmental management. The value of industrial waste ratio for fiscal 2001 was 16.9 %, an improvement of 0.1 points over the previous fiscal year. In the future we hope to achieve 12% of the fiscal 2005 target by development of manufacturing technology and process.

Value of industrial waste ratio



Development of technology to reduce value of industrial waste ratio

The main value of industrial waste is accounted for by waste produced in the manufacturing process of film and tape. Approximately 70 percent of this waste is accounted for by leftover cuttings, loss when starting, stopping and switching production. The entire Nitto Denko Group including both domestic and overseas companies cooperates in developing manufacturing technologies to reduce waste produced in such manufacturing processes.

Technology to reduce industrial waste (study example)

		Themes	Corresponding technologies
Value of industrial waste	Polarizing plate manufacturing process	Improvement of punching yield	Inclined orientation technology
		Defective appearance	Nesting technology
		Faulty lamination	Clean technology
		Process loss	Bubble-free lamination technology
		Raw material changeover loss	Stretch break prevention
			Longer raw material
	Adhesive tape manufacturing process	Production start/changeover loss	More stable coating conditions
		Leftover cuttings loss	Technology to minimize leftover cuttings

Environmental Activities of Fiscal 2001

Results of Voluntary Plan 2

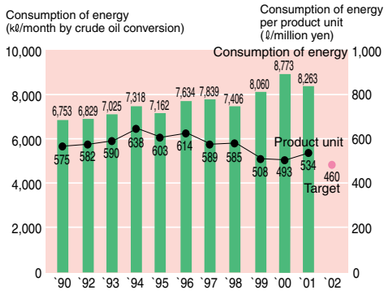
Initiative for Reducing CO_2 Emission

Introducing a cogeneration unit and boiler turbine that uses waste heat at our Toyohashi plant, we have begun to take measures including reexamination of forms of supplying energy. Concerning consumption of energy per product unit, it may be impossible to achieve the fiscal 2002 targets and we may have to revise the targets downward.

Consumption of energy and consumption of energy per product unit

Consumption of energy was reduced to 8,263kℓ/month, but consumption of energy per product unit took a step backward to 534ℓ/million yen. We may therefore unable to achieve the targets for fiscal 2002. The cause of this is the influence of approx. 40ℓ/million yen because of decline in production due to economic recession and, approx. 20ℓ/million yen due to a reduction in price, and approx. 30ℓ/million yen due to insufficient energy saving measures. To resolve this situation, we are considering introducing a cogeneration unit at our Tohoku, Kanto and Kameyama plants.

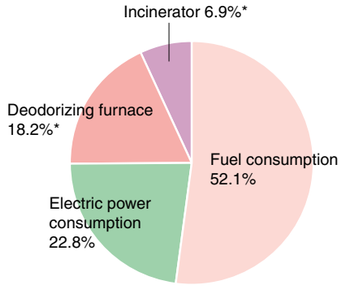
Consumption of energy and consumption of energy per product unit



Energy consumption and CO_2 emission

By introducing cogeneration, the ratio of CO_2 emission tends to be reduced but emission increases due to fuel consumption. CO_2 emission from deodorizing furnaces that from treat organic solvents by burning and incineration of waste converted to fuel are independently calculated from analysis results.

CO_2 emission by application



*Calculated from analysis results

Establishment of special subcommittees for saving energy

To promote a comprehensive study of ways to reduce consumption of energy, the Nitto Denko Group established a special subcommittees for saving energy under the environment committee at all our companies in April 2002. Activities are carried out by the members of the subcommittees, who are those in charge of saving energy appointed by the various plants and applicable group companies.

Objective of the special subcommittees for saving energy for all Nitto Denko Group companies

Bolstering system/structure for saving energy (mainly providing side) energy saving examples, company-oriented information sharing, outsourcing, consideration of ESCO service*1 etc., considering introduction of new energy such as fuel batteries*2 etc.

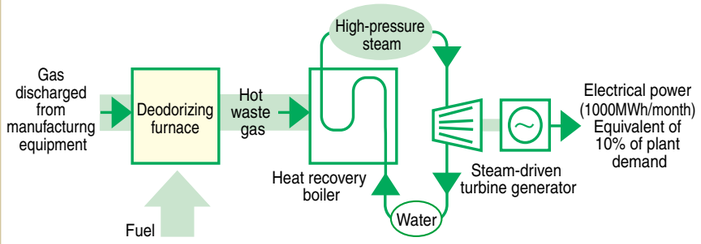
*1 ESCO service: Service that proposes ways to save energy and guarantees the effect.
*2 Fuel battery: Clean energy system that binds hydrogen of fuel with oxygen from the air to create electric power and steam.

Boiler turbine that uses waste heat begins operating

A boiler turbine that uses waste heat of deodorizing furnaces was completed and began operating at our Toyohashi plant in July 2001. This is a system that produces electricity using excess steam and waste heat that up to then could not be utilized. A system that efficiently converts 47% of the energy possessed by steam and waste heat, the boiler turbine is a gift of the leading energy saving technology of the New Energy and Industrial Technology Development Organization (NEDO). The system offers superior energy savings when load changes. Together with cogeneration, operation of this equipment that can handle ratio fluctuation of heat and electric power covers 75% by self-generation of electric power, realizing energy savings of 245 kl per month by crude oil conversion.

Steam turbine that produces electricity

Boiler turbine system flowchart



Results of Voluntary Plan 3

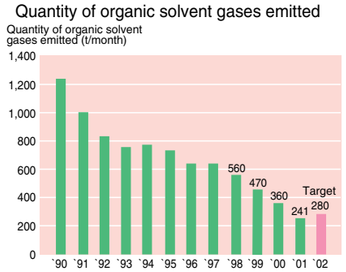
Initiatives for Preventing Air Pollution

Various organic solvents are used in the production of adhesive tape, which is Nitto Denko's mainstay business. Nitto Denko is therefore involved in development of product that do not use organic solvents and suppressing emission of organic solvents that volatize in the manufacturing process. Nitto Denko ranks solvent reduction technology as the highest priority research and development theme. Our Research and Development is concentrating its effort in development of solvent-free products.

Quantity of organic solvent gases emitted

Organic solvents are primarily used for dissolving adhesive for adhesive tape. Almost all the organic solvent is volatized in the drying process. That part is emitted into the atmosphere. The quantity of organic solvent gases emitted in fiscal 2001 was reduced by 1,434 t (approx. 120 t/month) to 2,886 t (approx. 241t/month). By doing so, we have already achieved our target values for fiscal 2002.

Quantity of organic solvent gases emitted



Suppression of quantity of organic solvent gases emitted

As a way of dealing with that problem at its destination to suppress emission of solvent volatized in the drying process into the atmosphere, we are promoting closing of the drying process, updating and repairing old solvent recovery units and combining deodorizing furnaces (equipment to treat solvent gas by burning). Solvent recovered by solvent recovery units is reused after being refined. In fiscal 2001, we installed a high energy saving heat accumulation type deodorizing furnace at our Tohoku plant.

Development of technologies to produce solvent-free tape

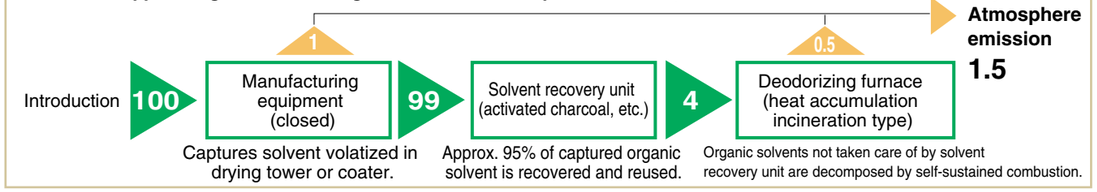
As a way of dealing with that problem at its source, we are promoting technology development for realizing solvent-free adhesive tape that does not use organic solvents. Because we produce various types of products used for various applications, we are characterized by working on various aspects of the following 5 technologies for eliminating use of solvent according to application.

- **Emulsion tape using water instead of solvent**
- **Solid adhesive used for polymers that are softened at high temperature**
- **Hot-melt adhesive whereby adhesive is melted by heat**
- **High-solid adhesive with reduced solvent content**
- **Ultraviolet-polymerized adhesive that uses adhesive whereby light hits material applied to base material**

Main solvent-free technologies

Technologies	Features of technology: Permanent adhesive (Heat resistance and durability)	Features of technology: Temporary adhesive (High initial adhesive)	Features of technology: Reusable (Easily peeled after use, leaves no residue)	Merits	Main applications
Emulsion tape	○	○	◎	·High polymer adhesive. ·Highly reusable.	 ■Masking tape for building and painting ■Vinyl electrical tape ■Surface protection film
Hot-melt adhesive	×	◎	△	·High production efficiency. ·Production can be carried out in small space, low equipment cost.	 ■Tape for paper diapers ■Stick-on kairo
Ultraviolet-polymerized adhesive	◎	○	△	·High function products can be made. ·Adhesive can be made thick.	 ■Double coated adhesive tape for joining metal

Method of suppressing emission of organic solvents and expected results (survival rate with amount introduced as 100)



Environmental Activities of Fiscal 2001

PRTR Initiatives

It is said that more than 100,000 types chemical substances are used for various applications. These chemicals support our abundant lifestyles and provide us with convenience. Pollutant Release and Transfer Register (PRTR) is a system by which a business that uses chemicals that could possible affect the health of human beings or the ecosystem must tabulate the quantity of such chemicals discharged or transferred and report it to the government. Businesses are obligated by the PRTR Law to carry this out under certain conditions. Since establishing Nitto Denko's special regulation concerning control of chemical substances in 1995, we have worked on proper control of chemical substances and have applied the regulation since 1997 even before the PRTR Law went into effect.

PRTR tabulation results

In fiscal 2001, we used 65 of the substances regulated by the PRTR Law, and have worked on reducing them by controlling discharge of such substances. Nitto Denko is building its own original PRTR database system that can automatically calculate quantity of substances discharged and transferred from the amount purchased for each process.

Voluntary chemical substance management guidelines

To accelerate reduction of chemical substances containing substances regulated by the PRTR Law, Nitto Denko established the regulation concerning control of chemical substances in August 2001. Those of the chemical substances generally used that could possibly have an impact on the environment, safety/hygiene, or disaster prevention are classified into 3 classes:prohibition, reduction or control according to seriousness of environmental impact and legal regulations. Proper internal control is sustained for these. Construction of a database for each assessment class was completed in fiscal 2001. Since fiscal 2002, substantial management for reducing quantity of chemical substances used has been assigned a priority ranking and promoted. Special attention is given to reduction of dichloromethane, which was added to the list of regulated substances by revision of the "Safety Guidelines" of the Ministry of Welfare and Labor.

Substances regulated by the PRTR Law discharged in quantity of 1 t or more in fiscal 2001
(quantity discharged by each plant [t/year])

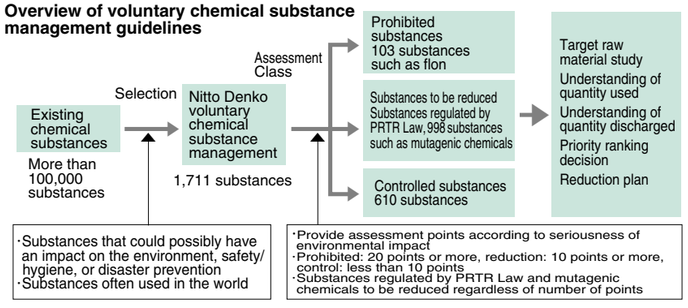
Plant	1998	1999	2000	2001
	Substance name Toluene			
Tohoku plant	201	206	196	170
Kanto plant	87	178	166	113
Toyohashi plant	4,674	3,790	2,824	1,723
Kameyama plant	7	5	5	5
Shiga plant	0	0	0	0
Onomichi plant	113	33	45	29
Kyusyu plant	0	0	0	0
TOTAL	5,082	4,212	3,236	2,040
	Substance name Dichloromenthane (Methylene chlorid)			
Tohoku plant	0	0	0	0
Kanto plant	0	0	0	0
Toyohashi plant	417	329	178	72
Kameyama plant	1	0	0	0
Shiga plant	0	0	0	0
Onomichi plant	0	0	0	0
Kyusyu plant	0	0	0	0
TOTAL	418	329	178	72
	Substance name Xylem			
Tohoku plant	0	0	0	0
Kanto plant	27	27	25	24
Toyohashi plant	4	4	2	2
Kameyama plant	5	0	0	0
Shiga plant	0	0	0	0
Onomichi plant	0	0	0	0
Kyusyu plant	0	0	0	0
TOTAL	36	31	27	26

Plant	1998	1999	2000	2001
	Substance name Dichloropentafluoropropane (HCFC-225)			
Tohoku plant	–	0	0	0
Kanto plant	–	0	0	0
Toyohashi plant	–	0	0	0
Kameyama plant	–	22	19	14
Shiga plant	–	0	0	0
Onomichi plant	–	0	0	0
Kyusyu plant	–	0	0	0
TOTAL	–	22	19	14
	Substance name Bis (2-ethylhexyl) phthalate (DOP)			
Tohoku plant	0	0	0	0
Kanto plant	0	0	0	0
Toyohashi plant	4	3	5	4
Kameyama plant	0	0	0	0
Shiga plant	0	0	0	0
Onomichi plant	0	0	0	0
Kyusyu plant	0	0	0	0
TOTAL	4	3	5	4
	Substance name Polyoxyethylene nonylphenyl ether			
Tohoku plant	–	0	0	0
Kanto plant	–	0	3	9
Toyohashi plant	–	0	0	0
Kameyama plant	–	0	0	0
Shiga plant	–	0	0	0
Onomichi plant	–	0	0	0
Kyusyu plant	–	0	0	0
TOTAL	–	0	3	9

Plant	1998	1999	2000	2001
	Substance name di-n-butyl phthalate (DBP)			
Tohoku plant	0	0	0	0
Kanto plant	0	0	0	0
Toyohashi plant	3	3	3	2
Kameyama plant	0	0	0	0
Shiga plant	0	0	0	0
Onomichi plant	0	0	0	0
Kyusyu plant	0	0	0	0
TOTAL	3	3	3	2
	Substance name Ethylene glycol Monomethyl ether (2-methoxy ethanol)			
Tohoku plant	–	0	0	0
Kanto plant	–	0	0	0
Toyohashi plant	–	0	0	0
Kameyama plant	–	2	2	0
Shiga plant	–	0	0	0
Onomichi plant	–	0	0	0
Kyusyu plant	–	0	0	0
TOTAL	–	2	2	0
	Substance name Acrylic acid			
Tohoku plant	0	0	0	0
Kanto plant	0	0	0	0
Toyohashi plant	3	4	1	1
Kameyama plant	0	0	0	0
Shiga plant	0	0	0	0
Onomichi plant	0	0	0	0
Kyusyu plant	0	0	0	0
TOTAL	3	4	1	1

–: Not measured because not applicable.

Overview of voluntary chemical substance management guidelines



Voluntary management method by management class

Management class	Management class	Management class
I. Prohibited substances	II. Substances to be reduced	III. Substances to be controlled
Management details	Management details	Management details
New use prohibited (analysis and experiments not included) Target fiscal year for banning substances currently being used to be decided and substances banned.	Amount used, amount discharged and amount used per product unit to be reduced.Reduction however takes amount used, amount discharged and other factors into account. Priority ranking, target fiscal year and amount to be reduced are decided and reduction is executed. Get a good understanding of amount used and approximate amount discharged.Reduction for substances regulated by PRTR Law is however executed by degree of accuracy decided by law.	Get a good understanding of amount used and approximate amount discharged. Substances specified by law are based on the law. If the plant determines it to be necessary, the plant's management class is decided with priority given to management class.

Maintenance and improvement of work environment

The Nitto Denko Group does its best to maintain and improve the work environment with setting own solvents concentration tagets. The target values are 1/10 or less of the values which were established by the Ministry of Welfare and Labor in the working place.

Voluntary management value of work environment concentration (copied)

Substance name	Ministry of Welfare and Labor management concentration	Voluntary management value
Xylene	100ppm	10ppm
Ethyl acetate	400ppm	40ppm
Dichloromethane	100ppm	10ppm
Toluene	100ppm	10ppm

Reduction of toluene emission into the atmosphere

Toluene, a substance regulated by the PRTR Law, is used to dissolve various substances. Produced in mass quantities as a byproduct of oil refining, it is easily obtained and widely used as a solvent. Nitto Denko also uses toluene in the manufacturing process of adhesive tape. Toluene and ethyl acetate*account for about 85% of the organic solvents discharged. Nitto Denko recognizes reduction of discharge of these substances to be a theme of great importance and is working on reduction of those substances.

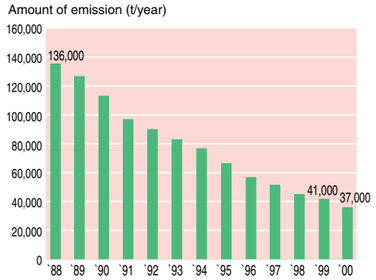
*Not regulated by PRTR Law

Reduction of toluene emission from Toyohashi plant

The Toyohashi plant, which produces a lot of adhesive tape, released 3,790 tons of toluene into the atmosphere in 1999. An extremely large figure for a single plant, it is the equivalent of approx. 5.8%* of all plants in the country for the year according to data collected by Keidanren. The amount of toluene discharged by the Toyohashi plant was large even compared to the data of America where the amount of toluene released into the atmosphere was effectively reduced by a similar system to PRTR that went into effect in 1986. Based on this awareness, concerning reduction of amount of organic solvents discharged, Nitto Denko has done its best to reduce amount of toluene emission from the Toyohashi plant in accordance with Voluntary Plan 3. In fiscal 2001, it was reduced to 1,723 tons.

*Whereas amount of toluene emission according to Keidanren study was 65,609 tons (estimated cover ratio of 84%), emission from the Toyohashi plant in fiscal 1999 was 3,790 tons.
*Toxic Release Inventory (TRI)

U.S. national toluene atmospheric emission transition (reference)



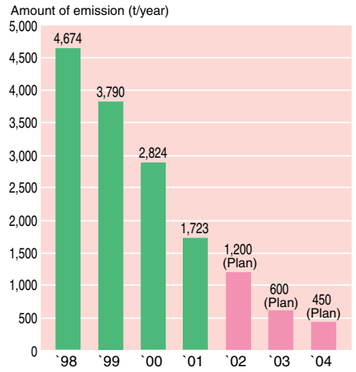
Toluene emission control at Toyohashi plant

Total emission of organic solvents such as toluene is not regulated by law in Japan, but there are cases where emission outlet concentration or at boundary line concentration are regulated by prefectural ordinance. In Aichi Prefecture where the Toyohashi plant is located, emission outlet concentration is restricted to 100 ppm and boundary line concentration to 60 ppm, which is strict even by national standards. We voluntarily control emission outlet concentration to 80 ppm, which is even lower than that. This is strictly monitored and the voluntary control value was never exceeded in 2001.

Toyohashi plant toluene emission reduction plan

As was previously stated, the amount of toluene released into the atmosphere at the Toyohashi plant has gradually been reduced, but is not yet to a satisfactory level. Our plan calls for reducing this amount to no more than 450 tons in fiscal 2004 by updating and repairing the solvent recovery unit, installing a deodorizing furnace, closing the manufacturing equipment and vigorously promoting development of solvent-free adhesive tape. The equipment investment pan has already been approved and work has begun.

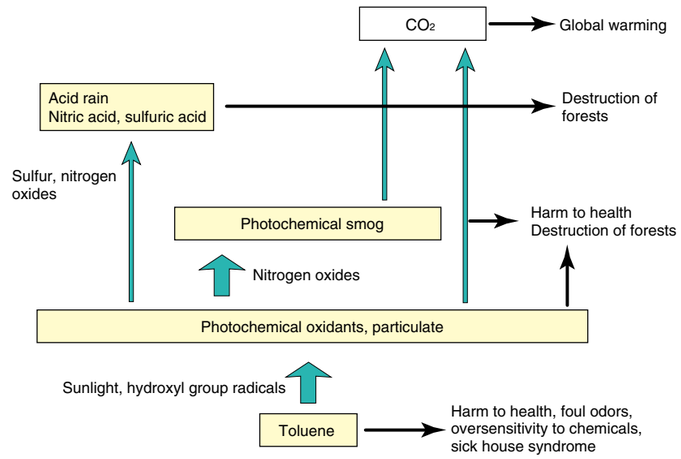
Toyohashi plant toluene emission reduction plan



Environmental impact of toluene

Toluene is easily broken down inside organisms and does not tend to become concentrated. When emitted into the atmosphere, half is decomposed by sunlight and substances in the air* in 4 days in the summer and several months in the winter. It is thought that toluene itself however can harm health by sick house syndrome and can effect the environment by decomposing product material. The main effects are given in the following flowchart.

*Primarily hydroxyl group radicals, etc.



Environmental Activities of Fiscal 2001

Results of Environmental Accounting

Nitto Denko Group companies find out the relationship between environment and management from our own point of view, tabulate the results using environmental accounting, and even publish a brief statement of accounts. Outside the company, we are active members of the Ministry of the Environment's "committee on corporate research of environmental accounting" and the Ministry of the Economy and Industry's committee.

Results of 2001

As a non-consolidated base,environmental impact cost has been reduced by the effect of unachieved budget of sales. Because the percentage of reduction was small compared with sales, environmental impact cost ratio was 18.8%, and 16.6% of the budget therefore was not achieved. On the other hand, with the settlement of accounts of the consolidated base started in fiscal 2001 by participation of 5domestic manufacturing group companies, it be- came 5.4%, surpassing the budget by 0.3 points.

Environmental budget results calculation table
(Nitto Denko non-consolidated base)
1. Environmental cost (million yen/month)

	Categories	Fiscal 2001 budget (A)	Fiscal 2001 results (B)	Balance (B–A)	Budget ratio (B÷A)
	Total sales	20,177.0	16,288.0	▲3,889.0	80.7%
	Production amount	19,695.3	15,290.1	▲4,405.2	77.6%
Environmental conservation costs	General and administrative overhead	72.4	81.3	8.9	112.3%
	Treatment for industrial waste	89.4	77.1	▲12.3	86.2%
	External services for envir-onmental management	21.5	18.9	▲2.6	87.9%
	Personnel	44.0	42.9	▲1.1	97.5%
	Depreciation	100.4	96.6	▲3.8	96.2%
	R&D&E	93.2	95.1	1.9	102.0%
	Total	420.9	411.9	▲9.0	97.9%
Environmental impact costs	Value of industrial waste	2,797.2	2,576.5	▲220.7	92.1%
	Energy	358.6	330.8	▲27.8	92.2%
	Organic solvents	182.3	130.1	▲52.2	71.4%
	Water	20.6	21.7	1.1	105.3%
	Total	3,358.7	3,059.1	▲299.6	91.1%
	Ratio of environmental impact costs	16.6%	18.8%	2.1%	112.8%

2. Benefical to the environment

	Categories	Fiscal 2001 budget (A)	Fiscal 2001 results (B)	Balance (B–A)	Budget ratio (B÷A)
	Environmental impact costs (million yen/month)	3,358.7	3,059.1	▲299.6	91.1%
	Ratio of environmental impact costs	16.6%	18.8%	2.1%	112.8%
	Cost of incinerating materials of value (million yen/month)	6.0	5.3	▲0.7	88.3%
Voluntary	Quantity of disposed industrial waste (t/month)	2,800.1	2,586.0	▲214.1	92.4%
	Recycling rate	—	91.3%	—	—
	Value of industrial waste ratio	14.2%	16.9%	2.6%	118.6%
	Consumption of energy (/month)	8,984.8	8,263.2	▲721.6	92.0%
	Consumption of energy per product unit (/million yen)	456.2	533.5	77.3	116.9%
	Solvent emission (t/month)	370.8	240.5	▲130.3	64.9%

Tabulation range
Nitto Denko non-consolidated base
*Ratio of environmental impact costs = environmental impact costs÷total sales

Environmental budget results calculation table
(Nitto Denko Group domestic companies)
1. Environmental cost (million yen/month)

	Categories	Fiscal 2001 budget (A)	Fiscal 2001 results (B)	Balance (B–A)	Budget ratio (B÷A)
	Total sales	3,160.4	2,638.5	▲521.9	83.5%
	Production amount	—	1,742.8	—	—
Environmental conservation costs	General and administrative overhead	2.1	0.6	▲1.5	28.6%
	Treatment for industrial waste	5.8	6.8	1.0	117.2%
	External services for envir-onmental management	3.4	2.3	▲1.1	67.6%
	Personnel	5.6	5.4	▲0.2	96.4%
	Depreciation	10.7	4.9	▲5.8	45.8%
	R&D&E	9.1	5.3	▲3.8	58.2%
	Total	36.7	25.3	▲11.4	68.9%
Environmental impact costs	Value of industrial waste	122.9	100.4	▲22.5	81.7%
	Energy	35.3	29.9	▲5.4	84.7%
	Organic solvents	21.3	12.5	▲8.8	58.7%
	Water	0.4	0.5	0.1	125.0%
	Total	179.9	143.3	▲36.6	79.7%
	Ratio of environmental impact costs	5.7%	5.4%	▲0.3%	95.4%

2. Benefical to the environment

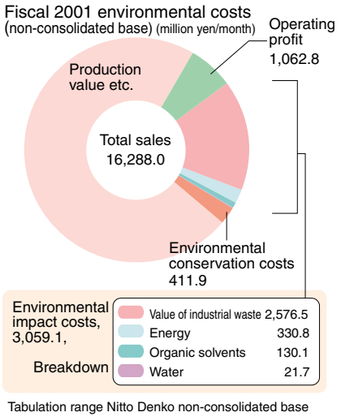
	Categories	Fiscal 2001 budget (A)	Fiscal 2001 results (B)	Balance (B–A)	Budget ratio (B÷A)
	Environmental impact costs (million yen/month)	179.9	143.3	▲36.6	79.7%
	Ratio of environmental impact costs	5.7%	5.4%	▲0.3%	95.4%
	Cost of incinerating materials of value (million yen/month)	0.2	0.3	0.1	150.0%
Voluntary	Quantity of disposed industrial waste (t/month)	217.6	185.4	▲32.2	85.2%
	Recycling rate	—	58.7%	—	—
	Value of industrial waste ratio	—	5.8%	—	—
	Consumption of energy (/month)	704.1	716.6	12.5	101.8%
	Consumption of energy per product unit (/million yen)	—	411.2	—	—
	Solvent emission (t/month)	43.4	40.6	▲2.8	93.5%

Tabulation range
Nitto Shinko Corp.
Nitoms Inc.
Saitama Nitto Denko Corp.
Mie Nitto Denko Corp.
Nitto Life-tech Co., Ltd.
*Ratio of environmental impacts costs = environmental impact cost÷total sales

Philosophy of environmental accounting

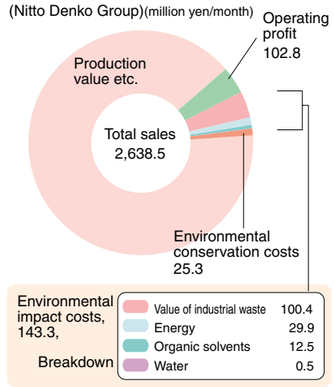
With the Nitto Denko Group's environmental accounting, in addition to environmental conservation costs, raw material and processing cost (value of industrial waste) of industrial waste, not used for product manufacturing and cost of energy, solvents and water consumed in the manufacturing process in the company, are defined and tabulated as environmental impact costs. Believing that reducing these environmental impact costs has an environmental effect, we are looking for ways to improve resource productivity and feel this is related to total low cost. Through environmental accounting, the Nitto Denko Group has switched its environmental policy from measures oriented toward treatment of conventional industrial waste (dealing with that problem at its destination) to establishment of manufacturing technology that does not produce waste (dealing with that problem at its source) in order to support both business and environmental conservation.

Fiscal 2001 environmental costs
(non-consolidated base) (million yen/month)



Tabulation range Nitto Denko non-consolidated base

Fiscal 2001 environmental costs
(Nitto Denko Group)(million yen/month)

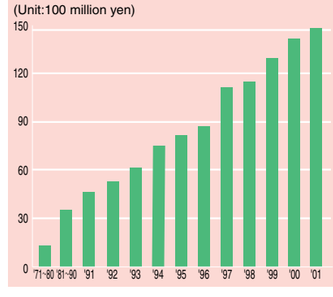


Tabulation range Nitto Shinko Corp. Nitoms Inc. Saitama Nitto Denko Corp. Mie Nitto Denko Corp. Nitto Life-tech Co., Ltd.

Investment in environmental conservation equipment

Investment in environmental conservation equipment in fiscal 2001 was 1.55 billion yen, coming to a total of 15.14 billion yen since 1971.

Total investment in environmental conservation



Flow cost accounting

The Nitto Denko Group has introduced flow cost accounting being developed in Germany etc., on a trial basis. With this type of accounting, costs from energy and raw material invested in production to indirect costs are separated into flow to manufactured products and flow to waste in order to get an understanding of both the amount of materials and money by process units. Flow cost accounting can help apply environmental accounting for internal business management. This activity also serves as a model for "Trade and Industry's committee on environmental accounting and study of advancement of eco-buisiness" of the Ministry of Economy and Industry. Effectiveness and possibility of introduction of the Toyohashi plant's adhesive tape for electronics as a model product was studied in fiscal 2001.

Merits of introducing flow cost accounting

- Clarifies amount of value of manufacturing accounted for by environmental costs for each product.
- Views problems by manufacturing process units to find a solution.
- Changes flow to waste into flow to products.

↓

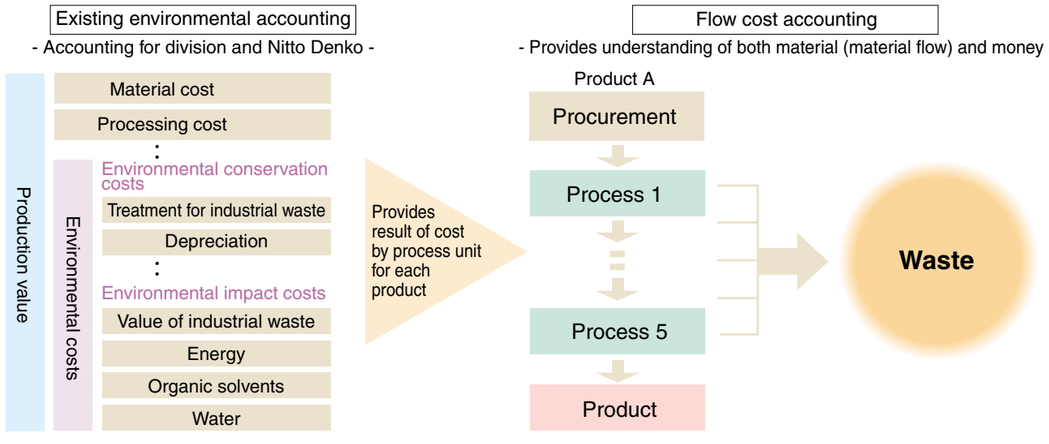
Enhancement of resource productivity

↓

Realizes total low cost

Existing environmental accounting and flow cost accounting

Separates from material input in production to indirect cost into flow to products and flow to waste to get an result of cost by process unit for each product, and is characteized by providing a good understanding of both materials and money.



Activities Plan for Fiscal 2002

Outline of Fiscal 2002 Environmental Activities Plan

Concerning environmental management for fiscal 2002, the Nitto Denko Group, which aims for harmony of environment and management, has established it environmental activities execution plan based on the corporate environmental policy and is proceeding according to the plan.

Environmental activities execution plan for fiscal 2002

The environmental activities execution plan for fiscal 2002 establishes the following 3 themes as important activities and puts emphasis on carrying out these activities.

(1) Preparation of a system of dealing with environmental risk communication
In order to achieve accountability to all stake-holders, we intend to publish information concerning our environmental activities, including the environmental report. By making use of the electronic version of the environmental report published on our Web site, we hope to provide environmental information publication with dual directionality and we are devising a system whereby we can apply the stake-holders' opinions in our activities.

(2) Bolstering of voluntary plan promotion systemThe voluntary plan ranks fiscal 2002 as the year we will achieve our targets. Based on a summarization of our efforts up to now, the system of promoting the voluntary plan is to be bolstered and the targets reconsidered for fiscal 2002. The next period targets have been established. Group targets are incorporated into the targets for individual plants and offices and are continuing individual initiatives. Concerning energy savings, which has been unfavorable, we have established a special subcommittees for saving energy for all companies and are vigorously promoting energy saving activities.

(3) Globalization of environmental activities and completion of management tools
Nitto Denko has established a network of overseas Nitto Denko Group companies in countries all over the world.

Because laws and conditions differ from country to country, environmental activities must be pursued with attention on fine details. Centered around overseas expansion of environmental accounting, we are attempting to spread global environmental activities based on environmental impact cost reduction activities. We are also synchronizing our conscious-sharing and activities by considering a global environmental management assessment system and holding international conferences on the environment.

We are also involved in the following initiatives.

Outline of fiscal 2002 environmental activities execution plan

Corporate environmental policy	Targets	Main measures
To expand linked statement of accounts of environmental activities as Nitto Denko Group.	Synchronization of environmental activities	Environmental auditing of overseas Nitto Denko Group companies, proposal of management standardization measures
		Linking environmental accounting with domestic/overseas Nitto Denko Group companies and holding international conferences
Aiming for "environmental management" whereby environment and business are as one, we take the various aspects of the environment into account for our activities and act accordingly. While simultaneously contributing to preservation of the global environment, we are attempting to realize total low cost.	Environmental communications	Executing accountability for publishing PRTR-related data, considered for all Nitto Denko projects
	Revision of voluntary plan targets and establishment of execution plan	Establishment of midterm plan at each plant or office and having budget for plan
		Initiation of special subcommittees for saving energy for all Nitto Denko Group companies and proposal of new energy saving measures
		Bolstering of development of solvent-free adhesive tape technology and establishment of targets for dealing with that problem at its source
	Expansion of environmental accounting application Effective management guidelines	Research and implementation of environmental guidelines and assessment method
		Trial of flow cost accounting and consideration of implementation
	Chemical substance management	PRTR system operation and maintenance
		Get understanding of toxic chemicals (voluntary controlled substances) and reduction plan proposal
	Environment-conscious activities execution byenvironmental impact assessment of product, LCA and promotion of green procurement	Establishment of method of assessing environment-conscious products and adoption of some products
		Adoption of some products concerning publishing of information and LCA execution
		Application of green procurement guidelines and creating of survey information database

New initiatives to be started in fiscal 2002

Summary and policy of environmental accounting

Continuing to reduce environmental impact costs is an important theme. Advancing technology development centered around reduction of value of industrial waste that accounts for a large percentage of this, we would like to continue our activities aiming to reduce environmental impact costs to 13% by fiscal 2005. In addition to the main manufacturing group companies participating in environmental accounting I fiscal 2001, we will implement environmental accounting at 7 main manufacturing group companies: Nitto Denko (Shanghai Songjiang) Co., Ltd. (China), Nitto Denko (Taiwan) Corporation, Nitto Denko Electronics (Malaysia) Sdn. Bhd., Nitto Denko Material (Thailand) Co., Ltd., Permacel (America), Hydranautics (America), and Nitto Europe N.V. (Belgium).

Summary of fiscal 2001 environmental accounting

- The ratio of environmental impact costs is still large.
  Nitto Denko non-consolidated base:18.8%
  5 domestic Nitto Denko Group companies:5.4%
- In addition to Nitto Denko non-consolidated base, 5 new companies are participating: Nitto Shinko Corp., Nitoms Inc., Saitama Nitto Denko Corp., Mie Nitto Denko Corp., and Nitto Life-tech Co., Ltd.
- Value of industrial waste accounts for majority of environmental impact costs.

Environmental budget and policy of fiscal 2002

- Value of industrial waste ratio budget
  Nitto Denko non-consolidated base:17.2%
  5 domestic Nitto Denko Group companies:5.1%
  7 overseas Nitto Denko Group companies:12.5%
- Reinforcement of securing profits and cost competition by activities for reducing value of industrial waste
- Reinforcement of initiatives for achievement of fiscal 2002 targets of voluntary plan

Voluntary plan target revisions

Fiscal 2002 is the year for achieving targets of the voluntary plan. Because of progress made in fiscal 2001, targets for consumption of energy per product unit cannot be achieved. Next period targets will be established for fiscal 2005 and later and environmental activities will be promoted.

Voluntary plan promotion plan
Plan to be executed in accordance with ISO14001 for achieving fiscal 2002 targets.

Voluntary plan 1
Along with achieving elimination of waste discharge for all plants by reduction and proper treatment of industrial waste, the entire Nitto Denko Group will start initiatives.

Voluntary plan 2
Although it appears that targets for energy saving will not be achieved for fiscal 2002, we will reset our sights for fiscal 2005 (establishment of next period targets).

Voluntary plan 3
Reduction of amount of solvents used by solvent-free technology for adhesive tape and reinforcement of production technology will help to reduce emission of organic solvents into the atmosphere (establishment of next period targets).

Voluntary plan 4
Raise efficiency by unifying internal auditing.

Voluntary plan 5
Global expansion of environmental accounting

History of environmental conservation activities

1960s
- Installation of solvent recovery unit
- Adoption of low-sulfur heavy oil

1970s
- Production of solvent-free adhesive tape started

1980s
- Installation of reuse (rectification) unit for recovered solvents
- Installation of deodorizing furnace (organic solvent gases incinerator)
- Changing of industrial waste to fuel

1993
- Establishment of voluntary plan

1996
- Establishment of corporate environmental policy

1997
- ISO14001 certification obtained
  (Certification obtained for all domestic production plants in fiscal 1998)

1999
- Operation of PRTR system
  Published environmental report

2000
- Adoption of environmental budget and environmental accounting system

2001
- Adoption of green procurement system
- Trial of environment-conscious products
- Trial of flow cost accounting