NITTO DENKO

For a Better Global Environment

Environmental Report 2001

NITTO DENKO CORPORATION

Contents

Company Profile

Company name: Nitto Denko Corp.
Established: October 25, 1918
Head Office: 1-1-2 Shimohozumi Ibaraki-shi, Osaka-fu
Capital: ¥26.783 billion (as of May 1, 2001)
No. of employees: 3,254 (as of May 1, 2001)
Consolidated sales: ¥365.697 billion (fiscal 2000)
Individual sales: ¥222.46 billion (fiscal 2000)

Facilities to which the environmental report applies

The information contained herein was compiled based on the record of achievements of Nitto Denko's seven domestic facilities from April 1, 2000 through March 31, 2001(fiscal 2000).

Working in Harmony with the Environment

Progress in science and technology has improved our lifestyles and has made our everyday more convenient. It has also caused contamination of air, water and soil, and has even had a negative impact on the global ecosystem.

In the world of today, businesses have to place a great deal of importance on "being in harmony with the environment" when planning and carrying out their business activities. At Nitto Denko, each department used to have its own system of environmental accounting. Environmental accounting has since been expanded to cover the entire Nitto Denko group, with environmental conservation costs and environmental impact costs being analyzed for each company. Each company has also proposed "ideas concerning reduction," with all employees of every company in the Nitto Denko group taking part in the efforts. Through these activities we have switched from placing emphasis on treatment and disposal of industrial waste (dealing with that problem at its destination) to reforming production technology so as not to produce waste (dealing with that problem at its source) in order to be compatible with both business and environmental conservation.

The ratio of environmental impact costs (the ratio of environmental impact costs occupied in total sales) for fiscal 2000 was 18.3 percent. We now intend to develop and advance technologies that emphasize reduction of value of industrial waste.

This report describes the Nitto Denko's environmental initiatives and the results of those initiatives for fiscal 2000. We hope the report will serve as a source of information concerning our approach to environmental conservation, and we would be happy to hear any comments or advice concerning this topic.

President

Brief Description of Main Products

Main Products of Our Seven Plants

Since being founded in 1918 for domestic production of electric insulation material, Nitto Denko has supplied all sorts of products to meet the needs of society through a combination of advanced technologies centered around high-polymer chemical technology. The company currently has seven domestic plants that produce products that could earn it the top global niche, beginning with the twelve top share products in the world.

Tohoku Plant

Medical Related Products Div.
Double Coated Products Div.

- Transdermal therapeutic patch
- Medical supplies
- Tissue cultured ginseng
- Surgical tape
- Taping tape
- Pesticides
- Water soluble double-coated adhesive tape

●Transdermal therapeutic patch

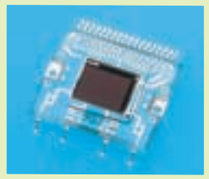
●Surgical tape

Kameyama Plant

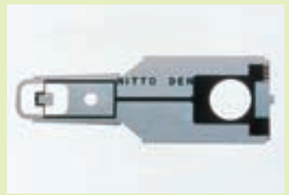
Semiconductor Related Products Div.
Printed Circuits Div.
Electronic Component Products Div.

- Semiconductor encapsulating resin
- Transparent encapsulating resin for optical devices
- Flexible printed circuits
- Thin metal core boards for HDD magnetro resistive heads

●Flexible printed circuits



●Transparent encapsulating resin for optical devices



●Thin metal core boards for HDD magnetro resistive heads

Kyushu Plant

Semiconductor Related Products Div.

- Semiconductor encapsulating materials
- Cleaning material for semiconductor manufacturing process

●Semiconductor encapsulating materials

Onomichi Plant

Optical Related Products Sector

- Optical film for liquid crystal displays (polarizing films, retardation films, polarization converting system)

●Polarizing film

●Polarization converting system

Toyohashi Plant

Tape Products Div.
Double Coated Products Div.
Tape Applied Products Div.
Optical Related Products Sector
Electronic Component Products Div.

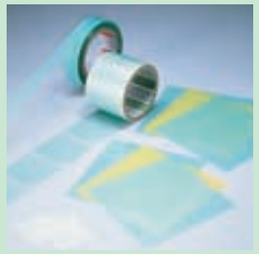
- Sealing materials, surface protection materials
- Surface protection film for automobile body
- Damping materials
- Double-coated adhesive tape, thermal adhesive film
- Precision machining and splicing system equipment
- Label raw material for printing
- Residential waterproofing and airtight products
- Paint masking and curing products
- Safety and display products
- Electrical equipment and bundling products (lead-free vinyl tape)
- Products for preventing corrosion and clean products for dustproofing
- Optical film for liquid crystal displays (polarizing films, retardation films)
- Transparent conductive film
- Tape for electronic components
- Tape for electrical insulation
- Heat-resistant barcode labeling systems
- Wafer protection system/materials for semiconductor manufacturing process

●Surface protection film for automobile body

●Surface protection film

●Double-coated adhesive tape

●Wafer protection system for semiconductor manufacturing process



●Thermal release sheet

●Masking tape

Kanto Plant

Engineering Plastics Div.
Electronic Component Products Div.

- Fluorocarbon resin products
- Porous film materials, polyimide belts
- Heat-resistant tape for electronic components

●Fluorocarbon resin tape

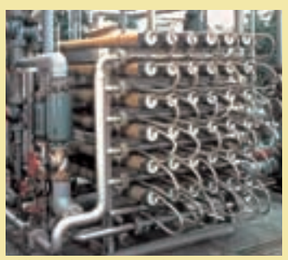
●Polyimide belts

●Porous fluorocarbon resin film materials

Shiga Plant

Membrane Div.

- High-polymer separation membranes (reverse osmosis membranes, ultrafiltration membranes, microfiltration membranes)



●High-polymer separation membranes

List of Products by Division

Tape-Material Business Sector	Tape Products Div.	Sealing materials, surface protection materials Surface protection film for automobile body Damping materials
	Double Coated Products Div.	Water soluble double-coated adhesive tape Double-coated adhesive tape, thermal adhesive film Precision machining and splicing system equipment Label raw material for printing
	Tape Applied Products Div.	Products for preventing corrosion Residential waterproofing and airtight products Paint masking and curing products Safety and display products Electrical equipment and bundling products (lead-free vinyl tape) Clean products for dustproofing
Optical Related Products Sector	————	Optical film for liquid crystal displays (polarizing films, retardation films, polarization converting system) Transparent conductive film
Electronic Materials Business Sector	Semiconductor Related Products Div.	Semiconductor encapsulating resin Transparent encapsulating resin for optical devices Cleaning material for semiconductor manufacturing process
	Printed Circuits Div.	Flexible printed circuits Thin metal core boards for HDD magnetro resistive heads
	Electronic Component Products Div.	Heat-resistant tape for electronic components Tape for electronic components, tape for electrical insulation Heat-resistant barcode labeling systems Wafer protection system/materials for semiconductor manufacturing process
Specialty Products Business Sector	Medical Related Products Div.	Transdermal therapeutic patch Medical supplies Tissue cultured ginseng Surgical tape, taping tape Pesticides
	Engineering Plastics Div.	Fluorocarbon resin products, porous film materials Polyimide belts
	Membrane Div.	High-polymer separation membranes (reverse osmosis membranes, ultrafiltration membranes, microfiltration membranes)

Environmental Conservation Initiatives

History of Environmental Conservation Activities

Nitto Denko has been involved in environmental conservation activities with emphasis on preventing air pollution by organic solvents since the 1960s. In 1996 the company established its corporate environmental policy based upon environmental management. Nitto Denko ranks environmental conservation as one of the most important themes for company management. The company has been involved in earnest environmental conservation activities such as compiling an environmental budget including introduction of its own original system of environmental accounting and reduction of waste, and hopes to realize total low cost through effective use of resources.

1960

- Solvent recovery system installed
- Began using low-sulfur heavy oil

Recovery and reuse of solvents and pure water used for high-polymer separation membranes at Nitto Denko.

■RO unit for recovering solvents

1970

Recovery and reuse of organic solvent gases

■Reuse (rectification) unit

Incineration of organic solvent gases

■Deodorizing furnace (with waste heat boiler)

- Began production of solvent-free adhesive tape

■Solvent recovery unit

1980

Conversion of industrial waste to refuse-derived fuel (RDF) (solid fuel derived from waste).

■RDF boiler

■RDF

- Unit for reuse (rectification) of recovered solvents installed
- Deodorizing furnace (incinerator of organic solvent gases) installed
- Industrial waste converted to refuse-derived fuel

Concentration and deodorizing of rarefied organic solvent gases

■Concentration/deodorizing unit

1990

■Adhesive Tape Research and Technology Center in Toyohashi plant

1992
- Established environment committee
- Established company packaging committee
- Nitto U-tech Corp. established (recycling business expansion)

1993
- Comprehensive company environment department established
- Voluntary plan drawn up

■Heat cycle exhaust treatment system

1994
- Specified chlorofluorocarbons banned

1995
- Regulation concerning control of chemical substances established
- Regulations concerning preliminary study of safety of raw materials, products and intermediate chemicals established

1996
- Corporate environmental policy established
- Adopted use of clean energy (LPG)

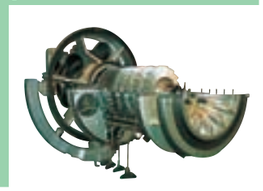
1997
- ISO 14001 certification obtained (Obtained for all domestic production facilities in fiscal 1998)

1998
- Trichloroethylene banned
- Adhesive Tape Research and Technology Center established
- Heat cycle exhaust treatment system installed
- Began converting garbage to compost

■Garbage disposal facilities

1999
- Co-generation system installed
- Began operating PRTR system
- Tetrachloroethylene banned
- Published environmental report

Co-generation system that makes effective use of generated heat



■High-efficiency turbine that serves as the heart of the system

2000

2000
- Environmental budget and environmental accounting system introduced
- Environmental budget compilation policy established
- Elimination of waste discharge achieved at Toyohashi Plant*

*This was achieved only for the month of March 2001, but is scheduled to be achieved for the entire year beginning in fiscal 2001. Company standards define "elimination of waste discharge" as being achieved when a minimum of 98 percent of industrial waste is recycled.

■Deodorizing furnace installed at Nitto group company Nitto Shinko Corp.

Themes for fiscal 2001
- Activities to eliminate discharge of waste to be expanded to all Nitto group companies
- Initiatives to enhance resource productivity
- Introduction of green procurement system
- Introduction of life cycle assessment (LCA)

■Green procurement guidelines

Environmental Management

Basic Policy and System of Promoting Environmental Conservation

Environmental conservation activities are part of management at Nitto Denko where “harmony with nature” are included in the management concept and “working to conserve the natural environment and save resources” are a standard for action. In accordance with the corporate environmental policy established in 1996, the company has established a system of advancing environmental policy that covers the entire company, from main office to production plants, centered around the environment committee.

Corporate Vision

Creating New Value

- Creating functional products that satisfy customers.
- Respecting the individuality of all employees and enabling them to achieve personal fulfillment through their work.

Employee Guidelines

- Remember 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.

- Respecting the environment and contributing to the global community.
- Strive to protect the environment and conserve natural resources.

CORPORATE ENVIRONMENTAL POLICY

Philosophy

At the Nitto Denko Group, we recognize that maintaining the health of the earth for coming generations 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 envi-ronment, both locally and globally, in all its operations.

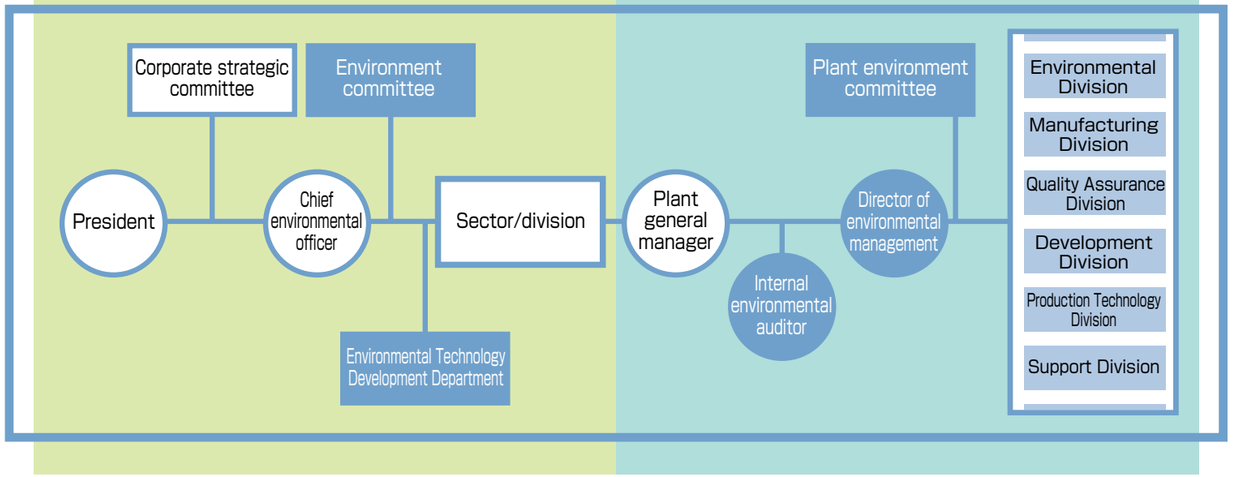
Environmental Policies

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 operations, we will develop internal environmental objectives and targets as far as is technically and economically practicable; moreover, we will pursue these objectives and targets in an organized manner to ensure 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 employees 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.**

This Corporate Environmental Policy is for public release.

System of advancing environmental policy for the entire company

The environment committee that meets twice a year is the highest company organization for discussing environmental matters. The decisions of the environment committee are applied to all company facilities. The plant general manager of each of our domestic production plants serves as the supervisor of environmental matters, and appoints the members of the plant environment committee, the director of environmental management, and the internal environmental auditor. An environmental management system suitable for the plant is implemented, maintained and improved, and environmental conservation activities are carried out in accordance with the various policies.



Environment committee

The environment committee is comprised of the chief environmental officer, the plant general manager, and members of the Envi-ronmental Technology Development Department. The primary function of the environment committee is to plan and put plans in motion to carry out environmental activities, to solve specified problems and to set up special subcommittees to carry out environmental activities. The envi-ronment committee is the highest company organization for discussing environmental matters. The matters discussed by the environment committee are forwarded to the corporate strategic committee to be decided and put into action.

Environmental Technology Development Department

Dedicated to environmental conservation, the Envi-ronmental Technology Development Department carries out the following activities and supports environmental conservation activities for the entire Nitto Denko group, particularly the technical aspects.

- Arrangement of environmental budget
- Establishment of environmental management system and expansion of system to all companies in Nitto Denko group
- Reduction of environmental risk
- Advancement of voluntary plan
- Disclosure of information and PR concerning the environment
- Control of chemical substances that have a negative impact on the environment

Internal environmental auditor

The internal environmental auditor directly appointed by the plant general manager annually audits the plant environmental management system to see if it is operating efficiently, targets of improvement are being achieved, and regulations are being followed. Environmental auditing is also conducted annually by people from another plant to enhance integrity of the system.

Director of environmental management

Appointed by the plant general manager, the director of environmental management is in charge of implementing, operating and maintaining the environmental management system. The director of environmental management is also provided with authority and responsibility regardless of company rank. Acting as an agent of the plant general manager, the director of envi-ronmental management is responsible for operating and upgrading the plant's environmental management system.

Plant environment committee

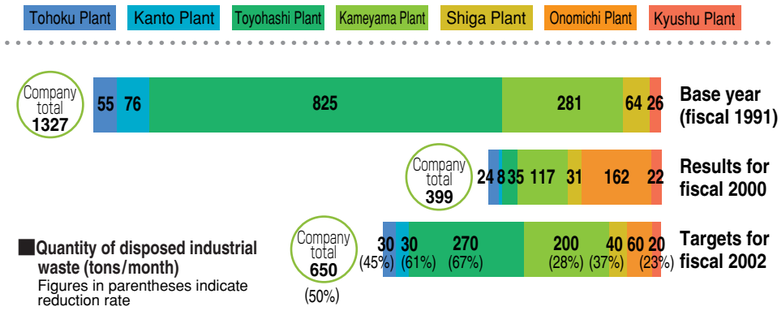
The plant environment committee is the highest organization for discussing environmental matters. The director of envi-ronmental management serves as the chairman of the committee and is comprised of the managers of the various divisions as well as the plant general manager. The committee meets once a month. The committee primarily checks up on whether environmental objectives and targets are being met, studies environmental problems at the plant, and sees to it that the environmental management system operates reliably while continuously devising ways to improve the system.

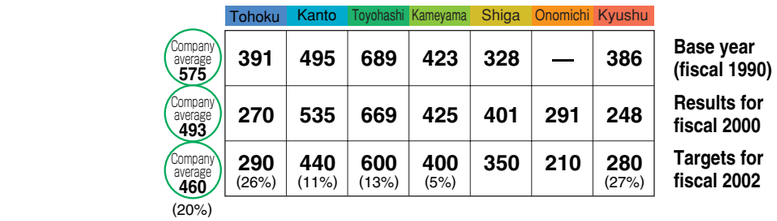
Environmental Management

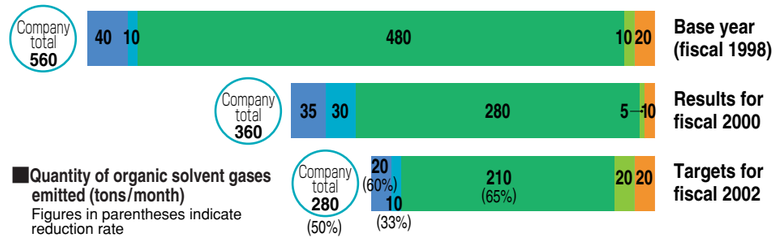
Achievement of Voluntary Plan Targets for Fiscal 2000

Nitto Denko's voluntary environmental conservation plan established in 1993 serves as a guideline for the company's environmental conservation activities. Nitto Denko's production plants carry out their activities in accordance with the plan. Targets for reduction of waste for fiscal 2002 were reached in fiscal 2000 -- two years ahead of time.

	■Targets for fiscal 2002	■Achievements for fiscal 2000
Voluntary Plan 1 **To reduce waste** Related article on pp. 13 - 14 **Waste generated by production is not only a waste of resources, but also poses the problem of treatment and disposal. Along with reducing the amount of industrial waste by improving yield, Nitto Denko is also involved in recycling industrial waste.**	**Quantity of disposed industrial waste: 650 tons/month** (By fiscal 2002, the company plans to reduce the quantity of disposed industrial waste by 50% in comparison to fiscal 1991.) Established as attainable target by dramatically improving recycling rate, with self-disposal as a premise.	**Quantity of disposed industrial waste: 399 tons/month** Targets for fiscal 2002 were reached with elimination of waste discharge being achieved at the Toyohashi plant and recycling activities at the Kanto and Onomichi plants. Targets have been revised upward beginning with fiscal 2001 and activities to reach the targets have begun.
Voluntary Plan 2 **To prevent global warming** Related article on pp. 15 - 16 **Use of fossil fuels has increased the amount of CO_2 (carbon dioxide) in the atmosphere, causing global warming. Nitto Denko is attempting to reduce emission of CO_2 by saving energy by improving consumption of energy per product unit*.** *Consumption of energy per product unit: Converting the amount of fuel or electric power used to crude oil is called "consumption of energy" "Consumption of energy per product unit" is consumption of crude oil per ¥1 million product unit.	**Consumption of energy per product unit: 460 liters/¥1 million** (By fiscal 2002, the company plans to improve consumption of energy per product unit by 20% in comparison to fiscal 1990.) The company's target is to hold down the amount of energy used to the 460 liters per ¥1 million worth of production by crude conversion. The figure suggests that this can be achieved through energy saving activities such as introduction of co-generation in specified energy control plants.	**Consumption of energy per product unit: 493 liters/¥1 million** Now that the second co-generation unit has begun operating at the Toyohashi plant, the amount of CO_2 discharge has been reduced and consumption of energy per product unit has been improved. Company-wide initiatives are continuing, such as installation of energy-efficient boilers and compressors at the Kanto and Shiga plants.
Voluntary Plan 3 **To prevent air pollution** Related article on pp. 17 - 18 **A large quantity of organic solvents is used in the manufacture of adhesive tape, our main business. When organic solvents volatize into the atmosphere, they may cause photochemical oxidants to develop, or may become a remote cause of acid rain or global warming. Nitto Denko is actively involved in reducing the amount of organic solvent gases released into the atmosphere.**	**Quantity of organic solvent gases emitted: 280 tons/month** (By fiscal 2002, the company plans to reduce the quantity of organic solvent gases emitted by 50% in comparison with 1998.) Taking the establishment of the PRTR system based in initiatives since the 1960s into account, Nitto Denko has intensified control of the amount of chemical substances discharged from its plants. The current target is to cut the amount discharged in 1998 by 50%, but the company hopes to ultimately reduce the figure to almost zero.	**Quantity of organic solvent gases emitted: 360 tons/month** The amount of solvents used as Nitto Denko plants has increased due to an increase in production. Emission of solvent gases has however decreased due to development of solvent-free adhesive tape and enhanced efficiency by improvements to the solvent recovery unit. A deodorizing furnace has also been installed at Nitto group company Nitto Shinko Corp.
Voluntary Plan 4 **International standards for environmental conservation** Related article on page 19 **Our domestic plants have obtained ISO 14001 certification, the international standard for environmental conservation. The company is currently taking steps to obtain certification for all companies in the Nitto Denko group, and is working to reduce impact on the environment in accordance with the environmental management system.**	The company set two targets for obtaining certification of the environmental management system (ISO 14001). One was to obtain certification for all domestic production plants during fiscal 1998, and the other was to obtain certification for all domestic production group companies during 2000.	The main office obtained ISO 14001 certification in fiscal 2000. All domestic production group companies except one have obtained certification. Six of the domestic sales companies that were not included in the target voluntarily took the required measures to obtain certification.
Voluntary Plan 5 **Aiming for global activities** Related article on page 20 **The overseas companies of the Nitto Denko group are involved in environmental conservation as well as those in Japan.**	Based on Keidanren's "Global Environment Charter," Nitto Denko hopes to achieve the same level of environmental conservation at its overseas operations as those in Japan.	Initiatives are currently being undertaken at Nitto Denko (Taiwan) Corporation, which was established in 1969. When building new plants overseas, the design is reviewed to make sure that Nitto Denko and local engineers take the natural environment into account at the planning and design stage.







Topics

New targets set for eliminating discharge of industrial waste

Because industrial waste reduction targets for fiscal 2002 have already been achieved, Nitto Denko has revised its targets upward and has accelerated company-wide efforts to achieve the new targets.

New targets

1. Recycling rate **98%** or higher (fiscal 2002)
   →Elimination of waste discharge from plants
2. Control Reduce value of industrial waste* that was 17% in fiscal 2000 by **2%** to 15% in fiscal 2002, and by **5%** to 12% in fiscal 2005.

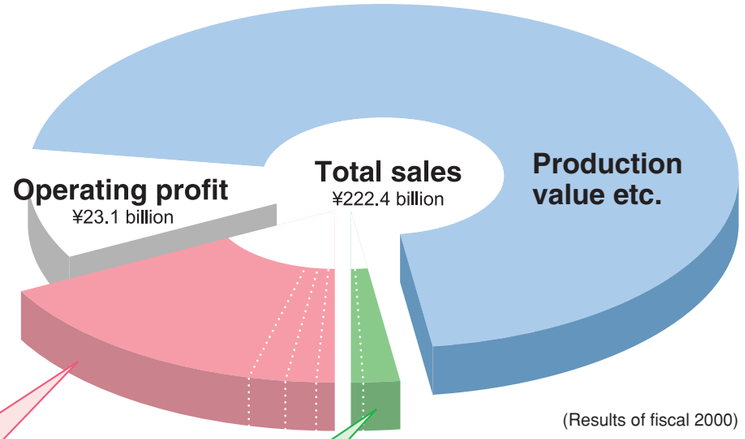
$$*\text{Value of industrial waste ratio} = \frac{\text{Value of industrial waste (cost of materials and processing)}}{\text{sales value of own products}} \times 100$$

Environmental Management
Results of Environmental Accounting

Nitto Denko has its own perception of the correlation between management and environment. With the company's system of environmental accounting, data is totaled and is disclosed to the public as a brief statement of accounts. The company also participates in the Ministry of the Environment's committee on corporate research of environmental accounting and is a member of one of the committees of the Ministry of the Economy, Trade and Industry. Starting in fiscal 2001, the company has been summing up its domestic manufacturing companies, and plans to expand this to include overseas in fiscal 2002.

Two environmental costs

In addition to environmental conservation costs including cost of treatment/disposal of waste, facilities and equipment (depreciation) and cost of developing technologies (R&D&E cost), there are environmental impact costs including the cost of raw materials that wind up becoming industrial waste instead of becoming part of a marketable product and cost of purchasing solvents that do not produce a profit. Nitto Denko's environmental management makes decisions based on administration and analysis of these factors.



(Results of fiscal 2000)

Environmental impact costs

Value of industrial waste*	¥35 billion
Energy	¥3.9 billion
Organic solvents	¥1.7 billion
Water	¥0.2 billion
Total	¥40.8 billion (¥3.4 billion/month)

*Cost of materials and processing of materials that wind up becoming industrial waste that does not produce a profit. Nitto Denko regards the ratio of value of industrial waste to sales value of own products as value of industrial waste ratio and uses it as a guideline for environmental management.

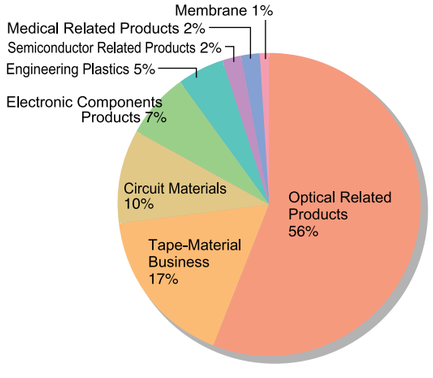
Environmental conservation cost

Environmental conservation costs such as treatment for industrial waste	¥3.8 billion
Environmental R&D&E	¥1.1 billion
Total	¥4.9 billion (¥407.9 million/month)

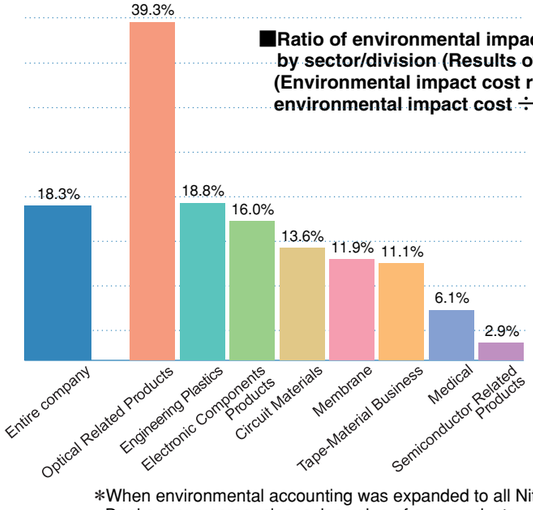
Environmental management philosophy

Devising suitable environmental measures according to environmental conservation cost and then reducing environmental impact cost by those measures is tied in with improvement of resource productivity and total low cost. This is the philosophy of environmental management that seeks compatibility of environment and business. Each year Nitto Denko puts together an environmental budget based on this philosophy, and clearly indicates responsibility of each sector/division.

Ratio of environmental impact cost by sector/division (Results of fiscal 2000)



Ratio of environmental impact cost by sector/division (Results of fiscal 2000) (Environmental impact cost ratio = environmental impact cost ÷ total sales)



*When environmental accounting was expanded to all Nitto Denko group companies, sales value of own products was changed to total sales beginning with fiscal 2000 results.

Results of fiscal 2000

Nitto Denko introduced environmental accounting in fiscal 2000 and disclosed the totals as an attached brief statement of accounts. This was carried out for Nitto Denko only for fiscal 2000, but the company plans to gradually add manufacturing companies belonging to the group starting in fiscal 2001. Nitto Denko's environmental accounting system has the following three features:

1. The environmental budget is revised annually using environmental accounting.
2. In addition to environmental conservation cost of the Ministry of the Environment's guidelines, the cost of materials and processing of materials that wind up becoming industrial waste that does not produce a profit (value of industrial waste) and cost of purchasing water, solvents and energy to be consumed within the company at the manufacturing stage are defined as environmental impact costs and are included in environmental costs.
3. Reduction of environmental impact costs is considered to be beneficial to the environment, and helps to enhance resource productivity and is tied in with total low cost.

Environmental accounting was carried out for Nitto Denko alone in fiscal 2000 for each sector/division. As a result, environmental impact costs more or less slid and increased to achieve the budget of total sales and sales value of own products. Environmental cost ratio (ratio of environmental impact costs occupied in total sales) was 18.3%. Continuing to advance technological development centered around reduction of value of industrial waste, as a concrete figure, the company hopes to reduce environmental impact cost ratio to 13%.

Environmental cost (Unit: ¥1 million/month)

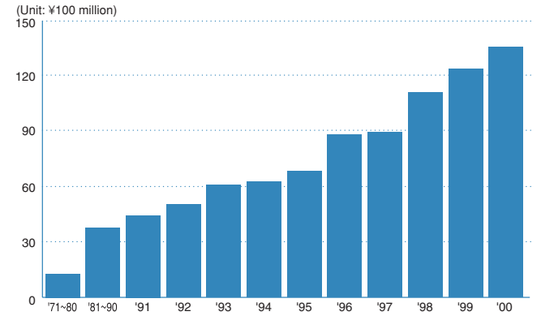
Categories	Fiscal 2000 budget	Fiscal 2000 results
Total sales	17,995.0	18,534.2
Sales value of own products	16,594.6	17,093.3
Environmental conservation costs		
General and administrative overhead	66.9	80.0
Treatment for industrial waste	68.7	79.1
External services for environmental management	20.2	19.2
Personnel	43.1	43.5
Depreciation	58.3	93.2
R&D&E	118.3	92.9
Total	375.5	407.9
Environmental impact costs		
Value of industrial waste	2,645.1	2,913.9
Energy	309.7	326.3
Organic solvents	150.0	141.1
Water	21.7	18.9
Total	3,126.5	3,400.2
Ratio of environmental impact costs	17.4%	18.3%

Applicable range of totaling: Nitto Denko only, April 2000 - March 2001

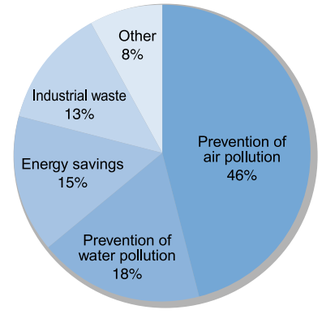
Investment in environmental conservation equipment since 1971

Nitto Denko has continuously introduced new environmental conservation equipment and technologies. The total investment is currently about ¥14 billion. In the past, the equipment and technologies dealt mainly with prevention of air pollution, but the percentage of equipment designed to save energy is on the rise. The second co-generation unit was installed at the Toyohashi plant in fiscal 2000.

Total investment in environmental conservation (fiscal 1971 - 2000)



Breakdown of total investment in environmental conservation (fiscal 1971 - 2000)



Topics: Bringing out new potential for environmental accounting.

Nitto Denko is currently active in the Ministry of the Economy, Trade and Industry's committee on environmental accounting and study of advancement of eco-business as a model company of material flow accounting being developed in Germany. With this system, the flow of material to production and to waste is divided from material used for production to indirect cost so you can know the quantity and cost of materials for each process. The company feels that such a system of environmental accounting would be effective for internal management.

Committee meeting at Toyohashi plant

Results of Voluntary Plan 1

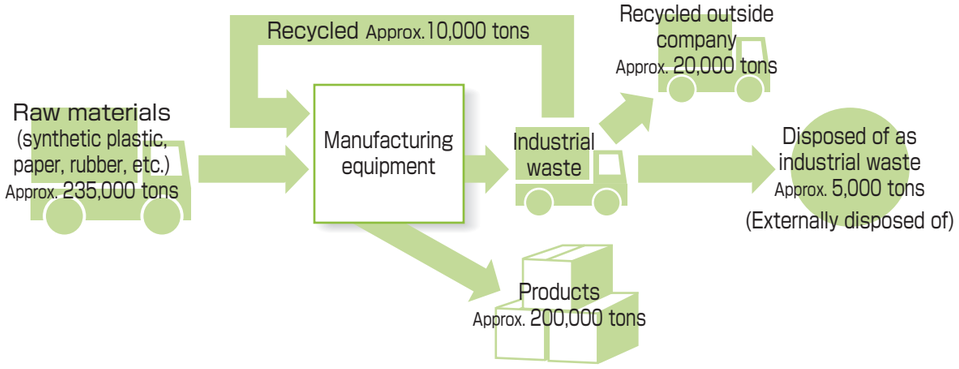
Initiatives for Reducing Waste

Control of industrial waste

Established in 1992, Nitto U-tech Corp. is involved in recycling materials found in industrial waste and thermal recycling (converting industrial waste into fuel). As a result of the company's activities, the amount of waste that had to be disposed of was dramatically reduced, achieving targets set for fiscal 2002 in fiscal 2000. The
Toyohashi plant eliminated the waste discharged from the plant in March 2001. Nitto Denko intends to expand its activities to achieve this throughout the company.
The company's project for reducing value of industrial waste since July 2000 achieved its original targets and was discontinued. Starting in fiscal 2001, based on those results, new technologies for solving these problems are being developed, primarily at the Production Engineering Development Center.

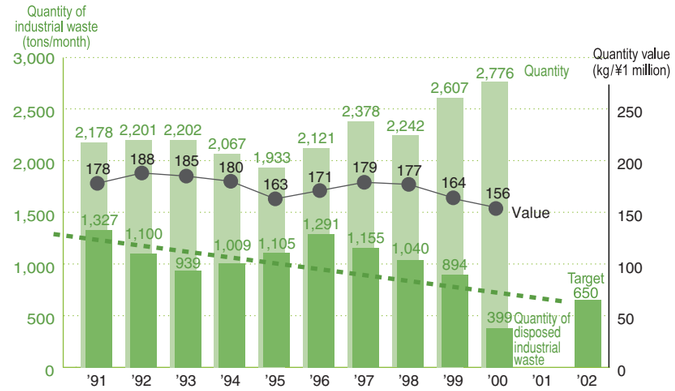
Raw materials flow

Approximately 200,000 tons of products were produced from about 235,000 tons of raw materials in fiscal 2000. The difference of 35,000 tons of industrial waste not has an impact on the environment but has an impact on management in the form of value of manufacturing (value of industrial waste).



Quantity of disposed industrial waste

The amount of industrial waste produced has become highest ever due to an increase in production. Thorough efforts with recycling however have reduced the amount of industrial waste disposed to its lowest level ever, with targets for fiscal 2002 being reached two years ahead of time.



Comparison of plants (fiscal 2000)

The quantity value of industrial waste produced at the Shiga plant increased from 162 last year to 290 due to a temporary increase in wastewater.

The component ratio for the Onomichi plant has risen from 15.4% last year to 19.5% because of an increase in sales value of own products.

■Quantity of disposed industrial waste per ¥1 million worth of production at each plant

■Comparison of quantity of disposed industrial waste

Topics

Toyohashi plant is the first to achieve elimination of waste discharge.

While 825 tons of industrial waste was discharged from the Toyohashi plant per month in fiscal 1991, discharge of waste was virtually eliminated by the end of March 2001. This was achieved by holding down the amount of waste produced by modifying manufacturing equipment and raising recycling rate by thorough sorting. This has become a model for eliminating discharge of industrial waste throughout the company.

■THE NIKKEI BUSINESS DAILY on Feb. 19, 2001

Treatment/disposal of industrial waste (fiscal 2000)

■Breakdown of treatment/disposal

Recycling rate has risen from 62% last year to 83% thanks to thorough sorting of materials. By working to eliminate discharge of waste, the company plans to increase its recycling rate to 98% or better by fiscal 2002.

Topics

Environmental awareness enhanced by awards

The following two awards have been established to promote environmental awareness among employees and facilities:

1. Value of industrial waste reduction award
Award for individuals and groups achieving outstanding performance in reducing value of industrial waste.

2. Award for elimination of waste discharge
Award for plants eliminating waste discharge.

Results of Voluntary Plan 2

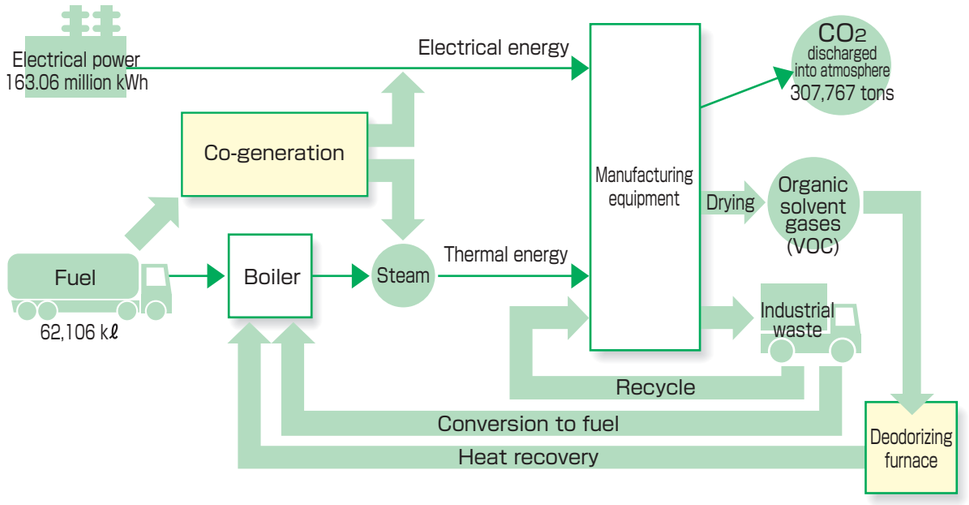
Initiatives for Reducing CO_2 Emission

Saving energy by co-generation

Co-generation (recovering heat in the form of steam produced when generating own power) is an effective means of controlling emission of carbon dioxide (CO_2) and saving energy. The first co-generation unit was installed at the Toyohashi plant in 1999 and the second in 2000. The units have reduced emission of CO_2 and have improved consumption of energy per product unit.

*The conversion factor of the Japan Report (1994) based on "UN Convention on Climatic Change" published by the Government of Japan in 2001 is used for quantity of CO_2 resulting from consumption of electric power and fuel. Quantity of CO_2 emitted from deodorizing and incineration furnaces is calculated from analysis data.

Energy flow

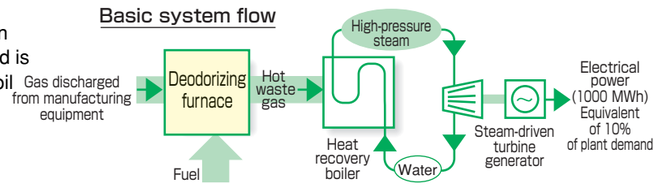


New equipment at Toyohashi plant eligible for NEDO support

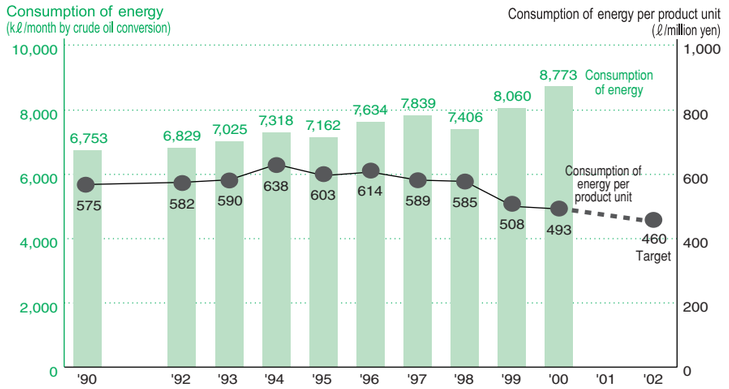
The turbine generator powered by a boiler heated by recycled heat from the deodorizing furnace was introduced with technical assistance of NEDO (New Energy and Industrial Technology Development Organization). The system converts surplus steam from a boiler heated by waste heat into electricity by means of a steam-driven turbine. The system effectively saves energy when demand fluctuates and can also adapt to fluctuation of heat to power ratio. Used in combination with co-generation, the system can cover 75% of the company's energy needs, and is able to save 245 kiloliters per month by crude oil conversion.

■Steam turbine that produces electricity

Basic system flow



Consumption of energy and Consumption of energy per product unit

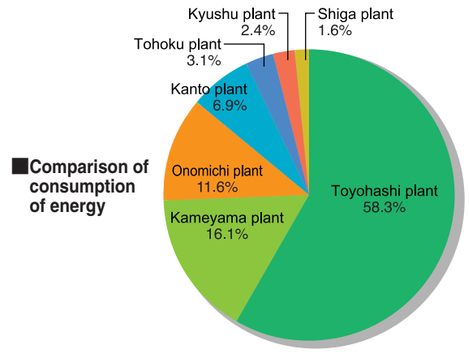


In addition to the second co-generation unit at the Toyohashi plant beginning to operate, consumption of energy per product unit production of transdermal therapeutic patches at the Tohoku plant and other high value-added products at various plants. Now that the turbine generator powered by a boiler heated by recycled heat from the deodorizing furnace has begun operating, it appears the targets for fiscal 2002 will be achieved.

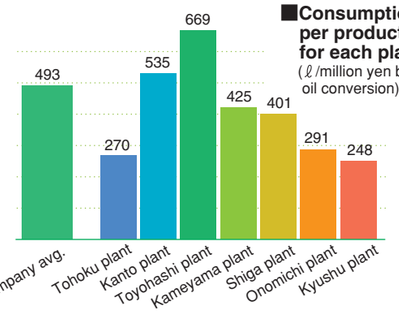
Comparison of plants (fiscal 2000)

The Tohoku, Kanto and Kameyama plants are now considering following the Toyohashi plant by introducing co-generation equipment.

■Comparison of consumption of energy



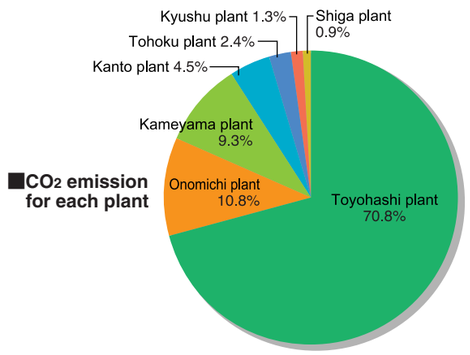
■Consumption of energy per product unit for each plant
(ℓ/million yen by crude oil conversion)



Consumption of energy and CO_2 emission (fiscal 2000)

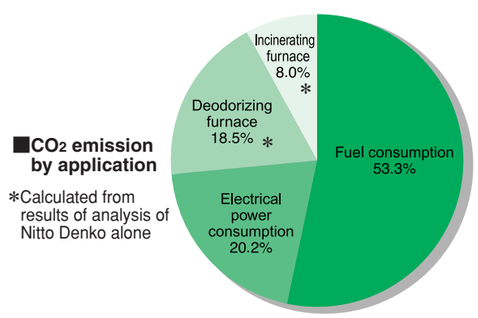
The ratio of CO_2 emission has decreased by about 19% together with a decrease in power consumption, compared with the previous year by application, but increased by 15% due to fuel consumption. This is primarily due to introduction of co-generation.

■CO_2 emission for each plant



■CO_2 emission by application

*Calculated from results of analysis of Nitto Denko alone



Results of Voluntary Plan 3

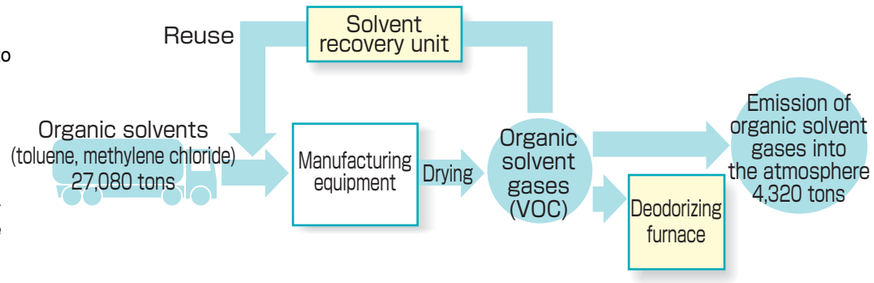
Initiatives for Preventing Air Pollution

Reduction of organic solvents

Various organic solvents are used to produce adhesive tape, and this is Nitto Denko's main business. The company is therefore taking measures to develop products that do not use organic solvents and to minimize organic solvents that volatize into the atmosphere during the production process. Emission of solvent gases has already been dramatically reduced by development of various types of adhesive tape that does not use organic solvents and installation of solvent recovery equipment and deodorizing furnaces (for incinerating organic solvent gases). Nitto Denko gives top priority to research and development of technologies to reduce use of solvents, and is giving its full support to the Adhesive Tape Research Center to develop adhesive tape that does not use organic solvents.

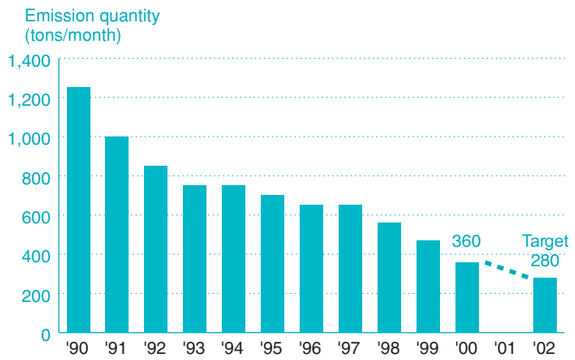
Organic solvent flow

Almost the entire volume of organic solvents used at Nitto Denko volatize during the drying process of manufacturing equipment. Taking measures to control emission of such gases, 4,320 tons of organic solvent gases were discharged into the atmosphere in fiscal 2000.



Quantity of organic solvent gases emitted

The amount of organic solvent gases escaping into the atmosphere has been reduced due to a higher percentage of adhesive tapes that do not use organic solvents such as craft tape and a better rate of solvent recovery.

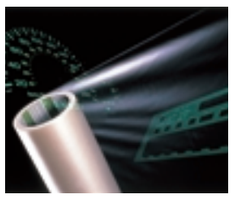


Development of technologies to produce solvent-free tape

Nitto Denko is working on development of technologies for following five themes to develop the ideal solvent-free tape for various applications:

- Emulsion tape that uses water instead of solvents
- Ultraviolet-polymerized adhesive polymerized by applying in sheets
- Hot-melt adhesive tape
- Solid adhesive that takes advantage of the fact that polymers soften at high temperatures
- High-solid adhesive with reduced solvent content

Double-coated adhesive tape



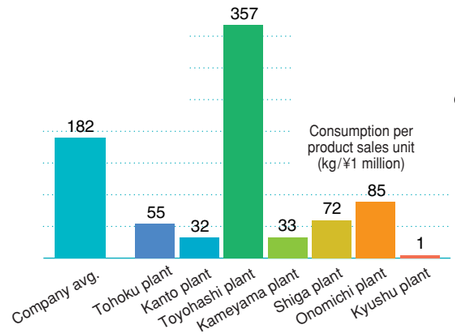
Surface protection film

Comparison of plants

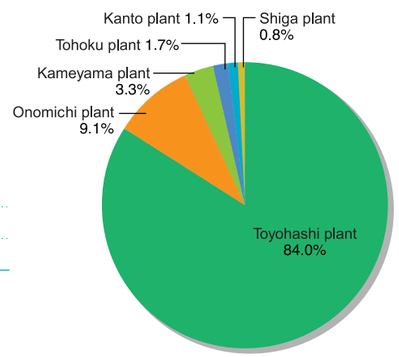
(fiscal 2000)

Consumption per product unit at the Toyohashi plant was reduced from 371 last year to 357. Using hot-melt technology for craft tape and an improved solvent recovery rate contributed to this.

Consumption of organic solvents per ¥1 million product sales unit at each plant



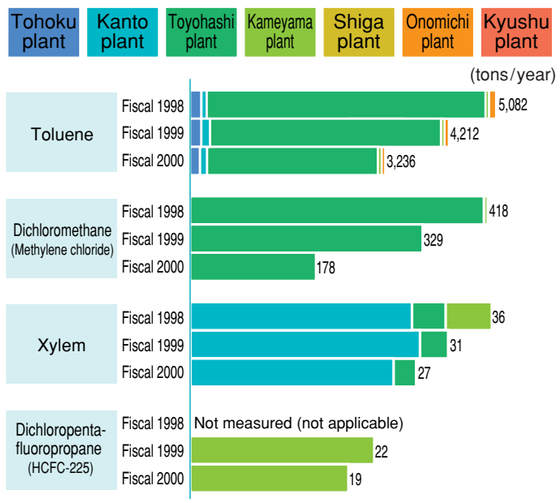
Comparison of consumption of organic solvents

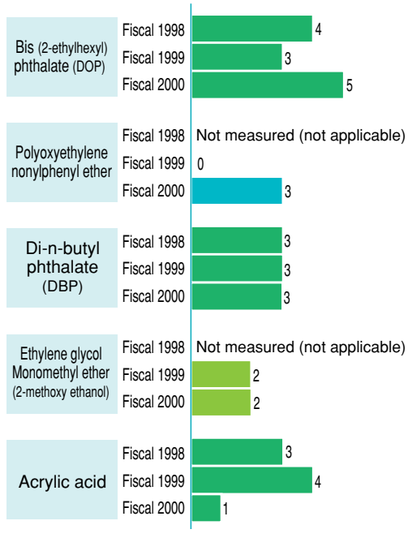


PRTR initiatives

Nitto Denko has been involved in PRTR (Pollutant Release and Transfer Register) to reduce the amount of toxic chemicals used and discharged since 1997. In fiscal 2000, the company used 63 of the 354 substances coming under PRTR applicable to the pilot project of the Ministry of the Environment, 26 of which were released into the atmosphere. Use of trichloroethylene was banned in 1998 and tetrachloroethylene in 1999. The company is also working to reduce discharge of organic solvents such as toluene and plans to continue to do so.

Substances applicable to PRTR discharges in quantities on one ton per year or more in fiscal 2000 (Percentage for each plant)





Results of Voluntary Plan 4

Initiatives for Environmental Management

Obtaining and applying ISO 14001 certification

Nitto Denko decided to obtain ISO 14001 certification for the Nitto Denko group even before the standard was established in 1996. Beginning with the Kyushu plant, certification was obtained for all company facilities by fiscal 2000. The movement to acquire certification is currently spreading from the company's domestic manufacturing and sales group companies to overseas group companies.

Obtaining ISO 14001 certification

ISO 14001 certification was obtained by the head office in July 2000; all domestic facilities have now obtained certification. Four of the domestic manufacturing group companies have obtained certification; certification has been finalized for all but one company. Five of the domestic sales group companies have also obtained certification.

■ISO 14001 certification status

Domestic facilities	Group companies (domestic/overseas)	
Obtained in fiscal 1999 or earlier	Obtained in fiscal 1999 or earlier	Obtained in fiscal 2000
Kyushu plant	Kyushu Nitto Denko Corp.	Kyoshin Shoji Co., Ltd.
Shiga plant	Mie Nitto Denko Corp.	Nitto Denko Matex Corp.
Kameyama plant	Nitto Shinko Corp.	Jinsec Corp.
Onomichi plant	Saitama Nitto Denko Corp.	Nitto Medical Corp.
Kanto plant	Nitto Logi-Com Corp.	Nitto Seiki, Inc.
Tohoku plant	Nitto U-tech Corp.	Nitto Analytical Techno-Center Co., Ltd.
Toyohashi plant	Permacel	Nitto Business Support Corp.
Obtained in fiscal 2000	Nitto Denko Electronics (Malaysia) Sdn. Bhd.	Nitoms, Inc.
Head office	Nitto Denko Materials (Malaysia) Sdn. Bhd.	Nissho Corp.
	Toyohashi Nikka Co., Ltd.	Nitto Lifetech Corp.
	Nitto Denko Packaging System Corp.	
	Kameyama Nikka Co., Ltd.	

Internal environmental audit

In compliance with ISO 14001, a strict internal environmental audit is conducted at all facilities. No particular problems were noted as a result of the audit conducted in fiscal 2000.

■Internal environmental audit

Results of Voluntary Plan 5

Initiatives for Supporting Activities of Overseas Operations

Environmental activities at overseas facilities

Nitto Denko supports the same environmental countermeasures for overseas facilities, particularly manufacturing companies, as are used at the company's facilities in Japan.

Initiative for preventing air pollution

Overseas group companies engaged in manufacture of adhesive tape have installed solvent recovery units and deodorizing furnaces to reduce discharge of organic solvents, and are operating with respect for the neighboring environment. The same emission standards or better are achieved at Nitto Europe N. V. in Genk, Belgium (established 1974), Permacel in New Jersey, USA (became group company in 1988), and Nitto Denko (Shanghai Songjiang) Co., Ltd. in China (established 1997) as in Japan. The company is also planning to install a deodorizing furnace at Nitto Denko (Taiwan) Corporation (NT) established in 1969 in Kaohsiung, Taiwan.

■Heat accumulating deodorizing furnace at Nitto Europe N. V. (Belgium)

■Catalyst deodorizing furnace at Nitto Denko (Shanghai Songjiang) Co., Ltd. (China)

■Heat accumulating deodorizing furnace at Permacel (New Jersey, USA)

Initiative for reducing CO_2 emission

The same type of heat cycle exhaust treatment system installed at the Toyohashi plant in 1998 (exhaust from the manufacturing process is detoxified by incineration and at the same time the thermal energy is recovered as hot air and supplied to production equipment) has been installed at Nitto Europe N. V. and Nitto Denko Material (Thailand) Co., Ltd. in Ayutthaya, Thailand (established 1997), reducing energy consumption by approximately 25% compared with the conventional manufacturing type.

■System of Nitto Denko Material (Thailand) (Ayutthaya, Thailand)

■System of Nitto Europe N. V. (Belgium)

Proper treatment of industrial waste

In order to support environmental activities of overseas group companies, the Environmental Technology Development Department has been conducting a study of impact on the environment by the various companies since fiscal 2000. The company checks the disposal site together with the local person in charge to make sure industrial waste is properly disposed of.

■Ultimate disposal site in Belgium

■Industrial park wastewater treatment facilities in Shanghai

Development of Environment-conscious Products

System for Producing Environment-conscious Products

Nitto Denko currently produces and sells about 12,600 types of products in 1,400 categories. The products are used constantly by consumers in a wide variety of industrial fields. Recognizing reduction of its products' impact on the environment to be an important theme for its environmental conservation activities, the company promotes development and popularization of environment-conscious products.

Definition and standards

Definition of environment-conscious Products

When obtaining ISO 14001 certification in 1997, Nitto Denko took the opportunity to establish its own original product assessment. The company uses the assessment as a guideline for product development. The company assesses environmental impact according to the life cycle of the product, and uses the following four conditions to determine if a product is environment-conscious.

1 Products must have less impact on the environment during production.

Products that use less solvents or solvent substitutes

2 Product must contribute to environmental conservation for customers and local area.

Lead-free products and halogen-free products

3 Product must contribute to reducing impact on the environment when used.

Air/exhaust cleaning products, wastewater cleaning products, energy-saving products, resource saving products

4 Product must be easily recycled when disposed of.

Easy-to-peel products, products that do not produce toxic substance when burned

New standards for assessing environment-conscious products

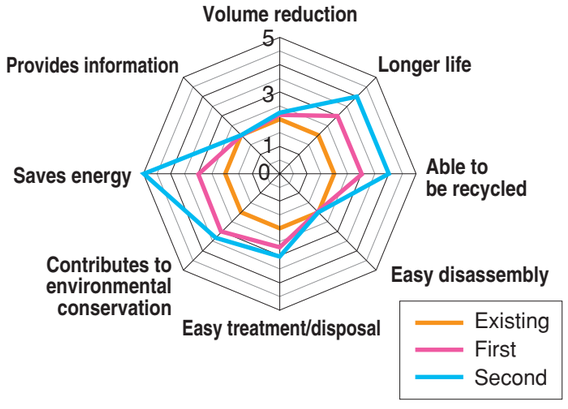
In order to realize a better quantitative and qualitative product assessment, new standards were introduced in 2001, and the company is planning development of environment-conscious products. The company plans to publish products that meet these standards on the company's Web site to better disseminate this information.

Examples of new product assessment

Environment-consciousness of products is examined from eight perspectives and development proceeds according to the assessment. A scale of 1 to 5 is used with existing products being a 2. Product totaling a 3 or better are considered to be environment-conscious. The assessment is conducted in two parts, with the first being the stage at which product development begins, and the second being the stage where the product goes into production.

Total assessment

	Existing	First	Second
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
Total assessment	2	2.6	3.2



Producing initiatives

Research and development

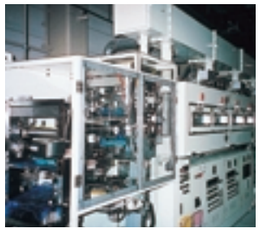
From the perspective of "expanding business opportunities through development of environmental technologies," the research and development departments of the main office and its divisions/departments have established technologies for reducing solvents and eliminating lead and halogen, and are developing products that help reduce impact on the environment.

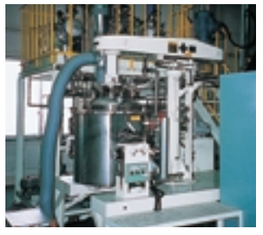
■Observing adhesive tape through an optical microscope

■Electrical conductivity assessment

Production technology development

Along with developing technology for improving production by enhancing speed and precision, the Production Engineering Departments of company plants and the Production Engineering Development Center are involved in establishing mass-production technology from the initial stage of product development in cooperation with the Research and Development Division. The Production Engineering Departments and the Production Engineering Development Center are also involved in developing technologies to reduce industrial waste based on the results of the previously described project for reducing value of industrial waste.

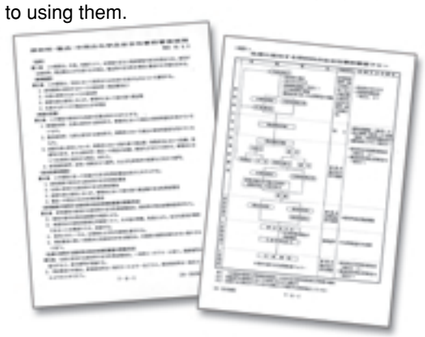




■Solvent-free adhesive tape prototype fabrication machine

Chemical substance management

Nitto Denko has created and has been using a database of information on chemical substances centered around regulation and law information based on MSDS (Material Safety Data Sheet). The company conducts a study of all chemical substances and makes sure they can be properly controlled prior to using them.



■Regulations concerning preliminary study of safety of raw materials, products and intermediate chemicals

■Flow of preliminary safety study of raw materials used in production

Green procurement and green purchasing

Nitto Denko has started a green procurement initiative following its own original guidelines in order to reduce impact on the environment when purchasing materials beginning fiscal 2001. Applicable items include raw materials, subcontractor's works, and general office supplies, and has added taking the environment into account as one of the guidelines for evaluating suppliers.

The guidelines are posted on our Web site at (http://www.nitto.com)

■Green procurement guidelines

Development of Environment-conscious Products

Main Environment-conscious Products

Nitto Denko has created many products to reduce environmental impact. The main products are described here.

Facilitates recycling (easy disassembly).

Recyclable, reusable double-coated adhesive tape can be peeled easily without tearing (No. 5000NS)

Facilitates disassembly and recycling of household electrical appliances and OA equipment.

Along with the Household Electrical Appliance Law that went into effect in April 2001, reuse of interior materials of television sets, air-conditioners is promoted, and makers are urged to make products easy to disassemble to facilitate recycling of parts. To meet this need, Nitto Denko has developed tape that comes off cleanly when peeled.

Doesn't tear or leave adhesive residue when peeled.

Uses strong non-woven fabric as the base. Special adhesive does not leave residue when peeled.

Main applications

Used for adhesive of cushioning and seals for OA equipment such as printers and copiers, and for household electrical appliances such as television sets and air-conditioners. Also used for bonding interior components of cellular telephones and computers.

Easy to dispose of.

Surface protection film for automobile body can be easily incinerated.

Uses materials that can be easily and safely incinerated.

Uses olefinic materials that can be easily incinerated when disposed of. Weight is reduced and disposal facilitated by decreasing thickness of base material and adhesive.

Protects coating from various environmental factors.

Protects automobile coatings from rocks, bird feces, dust during transport and acid rain until the finished automobile is turned over to the consumer.

Coating remains untainted after guard film is peeled off.

The adhesive has no impact on the shine and tone of the coating. Maintains luster of the coating and leaves no residue when peeled off.

Saves energy.

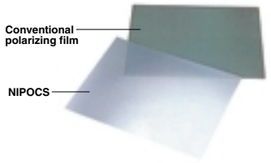
Polarization converting system (NIPOCS) for LCDs enhances screen brightness and contributes to energy savings.

Enhances brightness by 50% or more.

Applying the system to liquid crystal displays (LCD) of computers and cellular telephones converts polarization by 50 to 60%.

Saves energy.

With conventional polarizing film, 50% of the light from the source is wasted. With NIPOCS, the direction of the light is twisted, and is reused by reflecting it back to the reflection plate of the light source. Increases life by about 30% for screens of conventional brightness.



Saves energy.

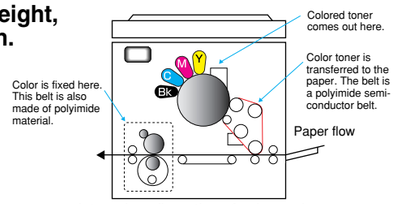
Polyimide copier belts reduce stress on heaters and enhance energy-efficiency.

Reduces stress on heaters.

Polyimide belts have less thermal capacity than metal. Stress on heaters is reduced by using for fixing rollers in copiers. Saves energy.

Realizes lightweight, compact design.

Weighs less and is more compact than metal rollers.



Internal configuration of color copier

Saves resources.

Certified eco-mark product uses recycled resources.

Craft tape using recycled paper (No. 7101 Series)

Base material consists of 40% or more recycled paper.

The base material of Nitto Denko adhesive tape consists of 40% or more recycled paper.

Uses solvent-free adhesive.

Uses hot-melt adhesive that does not use solvents. The tape has less impact on the environment both when manufacturing and when disposed of.

Easy to incinerate. Preserves the environment.

Halogen-free semiconductor encapsulating material does not produce toxic gases when incinerated.

Use of halogen eliminated by special flame retardant.

Commonly used halogen flame retardant produces toxic gas when incinerated. By using a special metal hydride in place of halogen, use of this dangerous material is eliminated. Flame resistance of metal hydride is V-0 of UL standards.

Easy to dispose of. Preserves the environment.

Lead-free polyvinyl chloride tape (No. 21 NPB Series)

Uses material with less impact on the environment.

Lead and lead pigment are used as stabilizers for conventional polyvinyl chloride tape. When the tape is disposed of, the lead elutes and contaminates underground water. Nitto Denko's No. 21NPB Series uses a calcium compound stabilizer and organic pigment to eliminate the use of lead.

Enhances efficiency, saves energy and space.

High polymer membrane/module able to change seawater into potable water.

(Spiral UF membrane filter element RS Series)

Energy saving filter.

Efficiently filters dirt from water without using a lot of energy. Can be used for systems that create purified water from wastewater and recycle starch effluent.

Maintains high efficiency for extended period of time.

Improved membrane and element configuration enables "reverse water cleaning" that is impossible with conventional filters. Designed for longer life.

Topics

Initiatives to improve packaging.

Nitto Denko established a company packaging committee in 1992 to find ways to make packing more environment-conscious based on the three concepts of "easy to dispose of" by eliminating toxic substances, "returnable" by use of returnable packaging, and "reduced mass."

■Nitto Denko uses polyvinyl chloride substitutes that do not produce toxic substances for packaging its products.

■Packaging using styrene foam is substituted for cardboard

■Plastic boxes, core and pads are used to make materials returnable.

Environmental Communication

Contribution to Local Communities and Employee Training

Nitto Denko continues to contribute to and support environmental conservation in the areas surrounding its plants all over the country in order to fulfill its role as a member of the local community. The company is also working to provide each and every one of its employees with a better sense of environmental awareness.

Local environmental conservation activities

Umeda River Cleanup Project 2000

The Toyohashi plant (including group companies) participated in the Umeda River Cleanup Project 2000 sponsored by the Mikawa Cleanup Council, and helped clean up the area through which the Umeda River flows.
(September 30, 2000)

Kameyama Cleanup Project

As part of its contribution to society, the Kameyama plant initiated a local road cleanup project in 1997. About 70 people participated in the sixth cleanup at primarily the Taokaji intersection of Route 1 in 2000. The Kameyama plant intends to continue to organize local beautification projects each year.
(August 5, 2000)

Yamadera-cho Cleanup Project

As part of its cleanup activities, the Shiga plant organized a roadside cleanup of Yamadera-cho in which the plant is located. About 80 kilograms of empty cans were collected in two hours.
(October 20, 2000)

Assistance for environmental conservation groups and funds

Nitto Denko supports environmental conservation by providing funding for groups involved in environmental conservation and donating money to environmental conservation funds.

Keidanren Nature Conservation Fund	Contribution to fund
29th Japan Society for Study of Environmental Change	Contribution to 29th convention
Toyohashi Green Association	Contribution to association
Mie Prefecture Green Promotion Society	Greenery community-chest drive

Visits from local company groups accepted

The Kanto plant is conducting environmental activities study tours by request of an organization of manufacturers in Saitama and Tochigi Prefectures.
16 representatives were given a tour of the factory to see what the plant is doing about reducing industrial waste.

Employee education

Environmental education based upon the environmental management system

In order to reliably operate and promote the environmental management system, the company provides employees with education to enhance self-awareness, training and ability in accordance with his or her duties concerning environmental conservation. New employees are also provided the education concerning environmental conservation during orientation training.

Type	Education item	Target
General	Common basic education and other two items	Manager of Education Division
		All members
Significant environmental education	Initial education and other three items	Workers to perform certain tasks
Special environmental education	Internal environmental auditor certification education and other three items	Appointee (Person scheduled to be internal auditor)

■New employee education

■Leaflets passed out to new employees

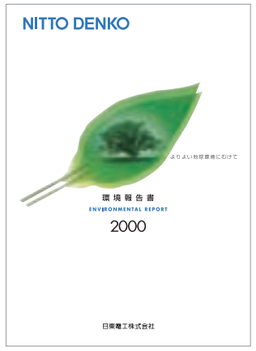
Distribution of environment cards

ISO 14001 certification cards, on which the corporate environmental policy and targets are printed, are distributed to employees at all company facilities. The employee fills out the “personal declaration” to enhance environmental awareness.

■Environment card of Toyohashi plant

Environmental report distributed to all employees.

The environmental report has been distributed to all company employees, including affiliates, in 1999 and 2000.



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