Thinking for tomorrow's sake



ECOreport 2005



NGK SPARK PLUGS | NTK TECHNICAL CERAMICS

NGK SPARK PLUG CO., LTD.



Corporate name	NGK Spark Plug Co., Ltd.
Head Office	14-18, Takatsuji-cho, Mizuho-ku, Nagoya
Foundation	October 26, 1936
Capital	47,869,270,000 yen
Business	(1) Manufacturing and sales of spark plugs and related products for internal combustion engines (2) Manufacturing and sales of new ceramics and their applications
Group companies	36 subsidiaries (10 in Japan, 26 overseas), 7 affiliates

Editorial Policy

NGK Spark Plug Co., Ltd. has issued an “ECO report” every year since 2000 with the purpose of clearly and simply describing our activities to reduce environmental load. In these reports we have sought to enrich the content of our social activities. We have tried to explain the process of our activities by describing the concept, mechanism and result of each action. Our company name, NGK Spark Plug Co., Ltd., is referred to as Nittoku in the text of this report.

Intended readers

IAll stakeholders including customers, investors, shareholders, residents of neighboring communities, business associates and employees.

Period covered

From April 1, 2004 to March 31, 2005
* Some other very recent activities and cases are also included.

Reporting scope

Environmental aspects: NGK Spark Plug Co., Ltd. and its 11 domestic affiliate companies
Social aspects: NGK Spark Plug Co., Ltd.

NGK Spark Plug Group

NGK Spark Plug Co., Ltd.
- Head Office/ Factory
- Komaki Factory
- Miyanojo Factory
- Ise Factory

Affiliates
- Nittoku Alfa Service Co., Ltd.
- Nittoku Unyu Co., Ltd.
- Ceramic Sensor Co., Ltd.

Group A
- Iijima Ceramic Co., Ltd.
- Nakatsugawa Ceramic Co., Ltd.
- Kani Ceramic Co., Ltd.
- Nansei Ceramic Co., Ltd.

Group B
- Kamioka Ceramic Co., Ltd.
- Nittoku Seisakusho Co., Ltd.
- Nichiwa Kiki Co., Ltd.
- Tono Ceramic Co., Ltd.

*Where a different definition applies, the scope of coverage is specified in each article.

: Block (joint acquisition of ISO14001)
Factories and companies in blue : Those issuing site reports.

Reference guidelines

Environmental Reporting Guidelines (Ministry of Environment)

Others

- Site reports
  Describe details of environmental action at NGK Spark Plug’s various factories and nine affiliated companies. For inquiries please refer to page 2.

- Website
  ECO report 2005 and back numbers can be read on our website.
  http://www.ngkntk.co.jp/environment

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	Komaki Factory	Environment and Safety Management Dept.	568-76-1544
	Miyanojo Factory	Environment and Safety Management Dept.	996-53-2211
	Ise Factory	Environment and Safety Management Dept.	596-39-1534
Iijima Ceramic		General Administration Dept.	265-86-5211
Nakatsugawa Ceramic		General Administration Dept.	573-68-5484
Kani Ceramic		General Administration Dept.	574-63-2511
Nansei Ceramic		General Administration Dept.	599-65-3366
Kamioka Ceramic		General Administration Dept.	578- 2-1112
Nittoku Seisakusho		General Administration Dept.	52-811-3921
Nichiwa Kiki		General Administration Dept.	52-382-0511
Tono Ceramic		General Administration Dept.	574-63-1031
Ceramic Sensor		General Administration Dept.	568-76-5400

To be a reliable company

NGK Spark Plug Co., Ltd.
President & Chief Environment Administrator
Norio Kato

Thorough corporate ethics

"Sustainability" is a commonly used word these days, and to promote the establishment of a sustainable society it is important to not only increase economic value but also play a social role in response to the expectations of different stakeholders. Such a social role can only be begun after the healthy development of society; together with the pursuit of economic success, it is also increasingly important to balance ethical and transparent corporate management and proper information disclosure.
Regarding the ethical aspect, the acts of each employee actually matter, as corporate activities get more complicated and speedy. Our company has shown the direction for firms to take through the adoption of our corporate philosophy in 1996 and corporate activity principles in 1998. In 2004, our "Activity Principle Guidebook" was published to identify the basis and criteria for the behavior of employees. We continue to enlighten all directors and employees to enhance their awareness of legal and ethical compliance and recognize that the acts of an individual represent the acts of the company.
As to information disclosure, we understand that simply disclosing management indices and information on products is not enough to meet the demands of our various stakeholders. We hope to tell stakeholders more about our company by identifying the information they really need and conveying it to them in reliable and easily understandable ways such as factory tours.
We believe these efforts will bring about results in the form of trust won inside and outside the company.

For NGK and NTK brand reliability

With 24 consolidated overseas subsidiaries and an export ratio of approximately 80 percent, the NGK Spark Plug Group has always maintained a global perspective and promoted optimal production based on a policy of quality products.
It is taken for granted that quality is the same across the world, wherever a product is purchased, and ensuring quality is one of the social responsibilities of a manufacturer. Nevertheless, it is not necessary for every factory to have the same manufacturing process as that in Japan, so we are aiming to organize a production system that harnesses the respective strengths of each factory. Such strengths will be further enhanced when their employees all have common dreams and targets and respect our culture.
With the participation of the employees throughout the whole NGK Spark Plug Group, including our overseas affiliates, we are working daily to win people's trust in the quality of the NGK and NTK brand.





Environmental management as a basis

In 2004, abnormal weather conditions occurred in many parts of the world, and people recognized once again the deterioration of the environment on a global scale.
Corporate environmental activities are attracting attention in a world where environmental problems such as global warming and the loss of biodiversity are becoming more serious and companies are required to make increasing efforts to tackle environmental issues.
The NGK Spark Plug Group also considers environmental activities to be a key task, and has implemented management and activities stricter than required by law, obtaining ISO 14001 certification jointly for 12 companies including Japanese affiliate companies. Our overseas affiliates are also promoting the establishment of standards for environmental activities under the same environmental policies as in domestic ones. Our first goal is for all business sites to acquire ISO 14001 certification as we aim to unify our approach and standards in environmental activities, and to centralize the information to cope with any environment-related emergency situation in a unified manner.

NGK Spark Plug Group Eco Vision 2010

In April 2004, we revised our environmental policies and environmental declaration significantly, formulated an environmental action plan for the period until 2005, and showed the targets to be achieved by 2010 in our "Eco Vision 2010." The aim was to shift from conventional environmental activities with a focus on legal compliance to a more positive and proactive approach to environmental issues.
The NGK Spark Plug Group as a ceramics manufacturer, recognizes that global warming is an especially important challenge because ceramic firing necessarily involves the generation of greenhouse gases including carbon dioxide. Although we have been engaged in energy saving and the reduction of greenhouse gas emissions in the efforts of rationalization for some time, total emissions have actually increased due to the steady increase in our production since 1990 in spite of lower emissions per unit production. As global warming is a matter of total emissions, we have set the reduction of total emissions as our target. To meet it, we will strive to achieve even more rational and efficient production through technical development.

Eco-design

To promote the development of a sustainable recycling-oriented society as a manufacturing company, it is necessary to consider the environmental load throughout the life cycle of products.
The NGK Spark Plug Group manufactures a wide range of products including spark plugs, different types of sensors, semiconductor components, electronic components, cutting tools and ceramics for industrial and medical use. In particular, our sensors are used for environmentally friendly purposes in diverse situations, and we are proud of them as our characteristic environmental products. Since it would be inexcusable for a company manufacturing environmental products to carry out environmentally unfriendly activities, we have taken various measures such as resource saving, energy saving and production free of hazardous materials since our early years. While actively adopting eco-design at the design and development stages through, for example, the use of LCA (life cycle assessment) and the improvement of environmental efficiency, we will also conduct environmentally friendly procurement, production, distribution and disposal.

Cultivation of fully eco-minded employees

The most important tasks for the sustainable development of a company are the development of its employees and transfer of its technologies.
To foster eco-mindedness, we will cultivate human resources who can naturally take environmentally friendly actions such as separation and recycling of waste, reduction of energy use and anti-idling. The accumulation of such actions by fully eco-minded employees will result in the achievement of the NGK Spark Plug Group Eco Vision.
We believe that the combination of manufacturing tradition and eco-friendly activities will have a synergy effect on society as well as our company.




NGK

Corporate profile

Corporate philosophy

Aiming to become a proposal-making corporation,
we continue to present new values to the world.
With global views and ideas,we pursue new values
linking technology and people.

Slogan
With established trust and confidence inside and outside
the company, we aim to contribute to the peoples of the world by
creating and putting at their disposal new values for the future.



Commitment

With full use of the most suitable technology and
our accumulated experience, we continue striving to offer new values
to the peoples of the world.

Management policy

We offer a working environment in which each one of
us is encouraged to make full use of his or her personality and
capability. With all our power we are dedicated to pursue
management based on trust and confidence.

Action guideline

Ever onward!
Always mindful of what is the best course, we swiftly put it into action.

Adopted in November 1996

Corporate activity principles

NGK Spark Plug Co., Ltd. will behave with social decency in accordance with the following ten principles in order to put into practice our corporate philosophy expressed in our slogan: “Contributing to the people of the world by offering new value that deepens mutual trust and looks to the future.”

1. We will respect human rights and abide by all laws and international rules as well as the spirit of the law, whether in Japan or overseas.
2. We will apply our best technology and accumulated experience in order to provide socially useful and safe products and services that satisfy consumers and customers and gain their trust while giving due consideration to the protection of individual data and customer data.
3. We will perform business transactions properly based on fairness, transparency, and free competition. We will also maintain healthy and correct relations with governments and public administrations.
4. We will place importance on communication not only with stockholders but also with the wider society, and release corporate data through our everyday public relations activities
5. We recognize that dealing with environmental problems is an issue for all mankind that absolutely requires the presence and action of corporations, and we will take action in an autonomous, proactive and speedy manner.
6. We will perform social contribution activities as a “good corporate citizen”.
7. We will respect the diversity and individuality of our employees and provide them with a safe and pleasant working environment that utilizes their abilities.
8. We will staunchly oppose antisocial movements and organizations that pose a threat to the order and safety of civil society.
9. We will respect local cultures and customs during our international corporate activities and carry out business that contributes to the growth of host countries.
10. Our top management will lead by example in the spirit of these principles, striving to cultivate a philosophy of logic by disseminating them throughout the company, publicizing them among group companies and customers, and incorporating them into the company structure.

Revised in November 2004

Activities for CSR

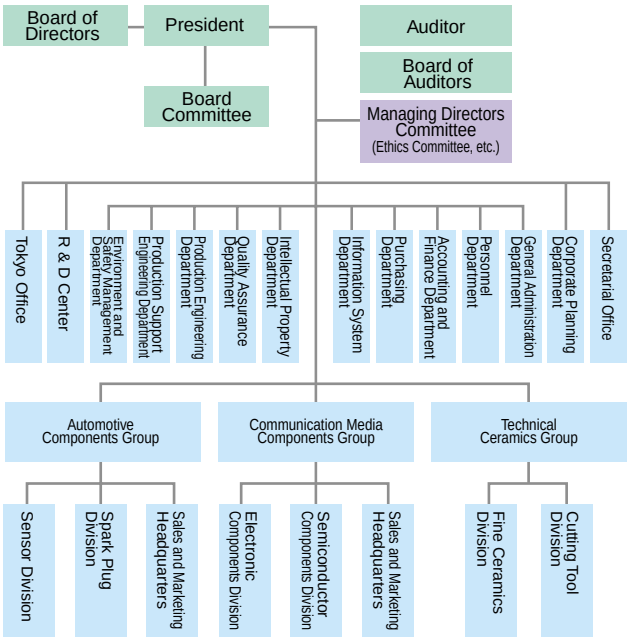
To fulfill our corporate social responsibility, it is a key management task to establish and maintain a management system that can promptly and properly deal with changes in the business environment while ensuring healthy and transparent management.
Nittoku adopted our corporate philosophy in 1996 and corporate activity principles in 1998 to show the direction to be taken as a firm. Our “Activity Principle Guidebook,” published in November 2004, shows the criteria for helping our employees make proper decisions and take appropriate actions.
We are encouraging all directors and employees to deeply understand legal and ethical compliance and to follow the corporate activity principles through various in-house training.

Nov. 1996	Adopted corporate philosophy
Feb. 1998	Adopted corporate activity principles
Apr. 1998	Established Ethical Committee
Feb. 2003	Adopted corporate ethics helpline system operation guidelines
Nov. 2004	Revised corporate activity principles
	Published “Activity Principle Guidebook”
Feb. 2005	Published “Guidelines on the Handling of Personal Information”



Activity Principle Guidebook

Organization



Financial Data

Account settlements as of March, 2005

	Consolidated	Non-consolidated
Sales (million yen)	241,185	210,496
Recurring profits (million yen)	27,711	22,496
Net profits for the year (million yen)	17,147	14,038
Net profits per share (yen)	77.01	62.98
Number of employees (people)	9,406	4,915

Number of employees as of March 2005

Products supporting the world



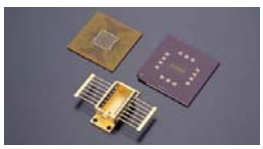
Spark plugs & glow plugs

These are essential parts for automobile engines. NGK spark plugs have developed alongside the history of our company. The current development emphasis is placed on an environmentally conscious design ensuring consistent efficiency, better exhaust quality and energy saving.



Sensors

We have developed and marketed various types of sensors that are indispensable in controlling emissions and improving the fuel efficiency of vehicles, conserving energy and preventing global warming. Of course we also have sensors to protect people's comfortable living spaces.



Semiconductor components

Our ceramic and organic packages fulfill the diverse requirements of semiconductor components which sustain the evolution of the IT industry, allowing them to attain higher integration, larger throughputs and smaller size for better environmental compliance.



Electronic components

Mobile phones have become indispensable in people's lives today. Working inside them are our dielectric filters and antennas, essential for sending and receiving radio waves. Our never-ending challenge is to achieve clearer voice communication and lighter weight.



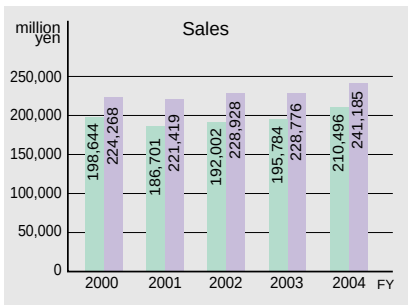
Cutting tools

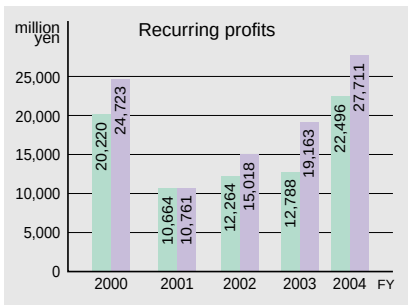
Our advanced cutting tools developed with our unique technologies enjoy a high reputation. The ceramic series is suitable for the high-speed cutting of cast iron and heat-resistant alloys, while the cermet series is used for semi-finishing and finishing of various steel works.

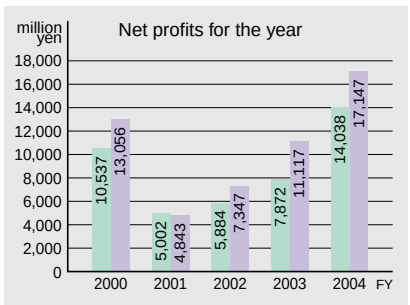


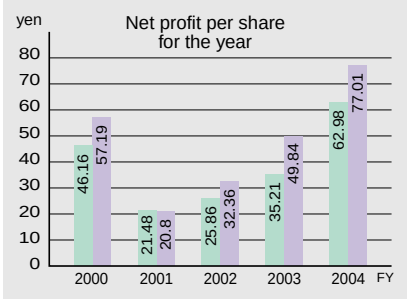
Ceramic application products

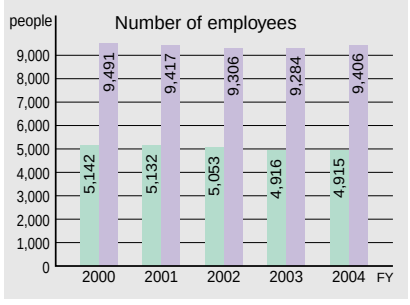
We also offer a variety of products that take advantage of the features of new ceramics. They cover a wide range of product areas from industrial machinery parts and eco-product such as ozonizers, to artificial bones and consumer products like ceramic heaters.

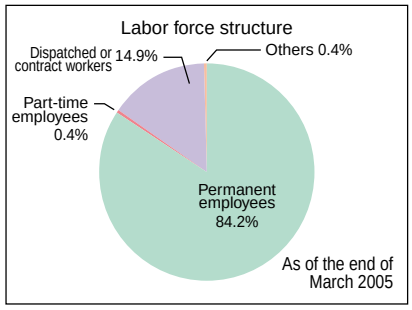












: Non-consolidated : Consolidated

Business activities and environmental impact

Environmental load from business activities

By properly understanding the resources and energy used in business activities as well as their environmental impact and manufactured products, the input and output of those business activities can be identified and an overall picture of a company can be seen. The products of the NGK Spark Plug Group consist mainly of ceramics and metal parts, and therefore use many resources in the forms of raw materials and parts. We also know that a large amount of energy and water is consumed for ceramic firing.
With continuous efforts to understand the material balance, we will look at the social impact of our business activities as a whole and examine more effective measures and improvement plans.

Material balance

Business sites in Japan

Input

Type	Category	Business sites in Japan
Energy	Purchased electricity	545,520 kWh
	Gas	6,015 m^3
	LPG	58 m^3
	Gasoline	178 KL
Paper	Photocopy paper	6.7 tons
Water	Tap water	3,538 tons

Output

Type	Category	Business sites in Japan
CO_2 from energy consumption	Office	196 tons
	Transportation	413 tons
Waste	Recycled waste	11.9 tons
	Landfill / burning disposal	3.8 tons
Wastewater	Wastewater	3,538 tons

- Factors used to calculate CO_2

Japan Auto Parts Industries Association (2001)

Category	CO_2 conversion factor
Purchased electricity	0.330 kg-CO_2/kWh
Gas	2.558 kg-CO_2/m^3
LPG	6.074 kg-CO_2/m^3
Grade A crude oil	2.712 kg-CO_2/L

Guideline to Methods of Calculating Emissions of Greenhouse Gases from Business Sites (Ministry of the Environment)

Category	CO_2 conversion factor
Gasoline	2.32 kg-CO_2/L
Diesel oil	2.62 kg-CO_2/L

- Not including energy consumption and CO_2 emissions due to transportation outsourcing.
- For some operation sites that have no installations to measure discharged volume, the wastewater volume is taken as the combined volume of tap water and well water.

Energy

Purchased electricity, Gas, LPG and Grade A crude oil : Use in production

Gasoline and Diesel oil : Use in tests and transportation

Classification	Our four factories	Group
Purchased electricity	191,780,000 kWh	303,790,000 kWh
Gas	13,980,000 m^3	14,620,000 m^3
LPG	1,810,000 m^3	3,950,000 m^3
Grade A crude oil	2,794 KL	2,794 KL
Gasoline	763 KL	781 KL
Diesel oil	83 KL	114 KL

Paper

Paper : Use of photocopy paper, packaging materials, etc. (estimated)

Classification	Our four factories	Group
Paper	2,148 tons	2,794 tons

CO_2 from energy consumption

Production,Test, Transportation : CO_2 emissions from energy consumption

Classification	Our four factories	Group
Production	117,603 tons	169,214 tons
Test	1,802 tons	1,802 tons
Transportation	212 tons	333 tons

PRTP-regulated substances

Air and water : Emissions of materials reported in different areas into the air and water

Classification	Our four factories	Group
Air	16 tons	174 tons
Water	0.1 tons	0.7 tons

Material balance

FY2004

Main raw materials

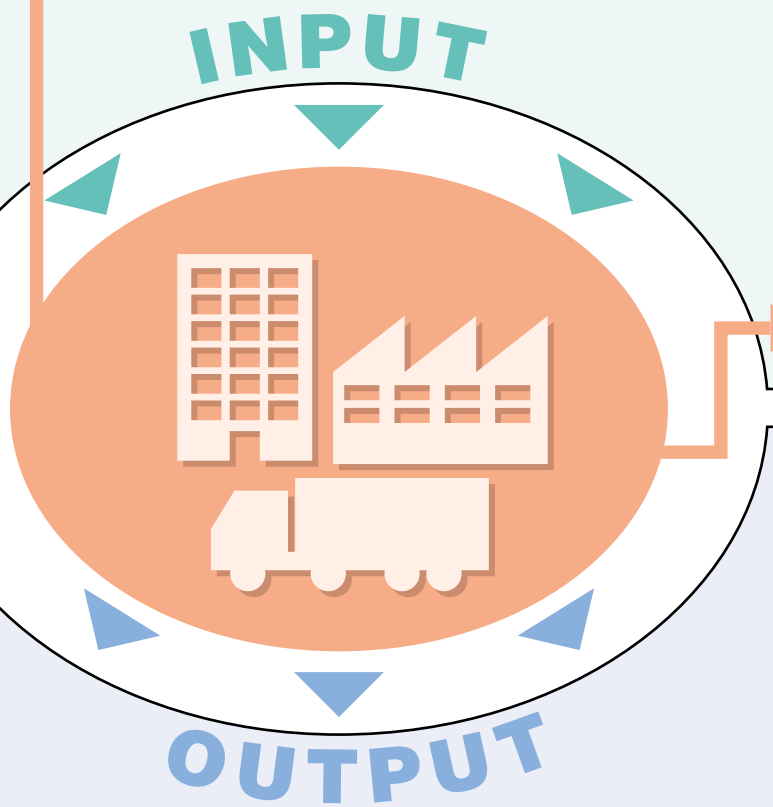
Ceramic materials and metals : Purchased amount
Reused elements : Reuse of ceramic materials

Classification	Our four factories	Group
Ceramic materials	——	13,713 tons
Metal materials	——	21,021 tons
Reused elements		10,841 tons

Other materials/auxiliary materials

Plastics, chemicals, oils, other materials and other gases : Use in different divisions (estimated)

Classification	Our four factories	Group
Plastics	611 tons	1,197 tons
Chemical substances	6,057 tons	8,840 tons
Oils	921 tons	987 tons
Other materials	623 tons	1,082 tons
Other gases	10,359 tons	15,049 tons



Water

Tap water : Use of tap water and industrial water
Well water : Use of groundwater
Recycled water : Reuse of water on-site after purification

Classification	Our four factories	Group
Tap water	730,869 tons	915,553 tons
Well water	970,565 tons	1,101,211 tons
Recycled water	969,593 tons	1,102,682 tons

Waste

Recycled waste : Amount of waste disposed of by recycling contractors (including the waste sold)
Landfill/incineration : Amount of waste used as landfill or incinerated by contractors

Classification	Our four factories	Group
Recycled waste	15,982 tons	18,305 tons
Landfill / burning disposal	89 tons	535 tons

Product shipment

Products : Amount shipped from different divisions

Classification	Our four factories	Group
Product	—— tons	27,724 tons

Wrapping/packaging materials

Plastics, paper and cardboard : Use in different shipping divisions (estimated)

Classification	Our four factories	Group
Plastics	349 tons	645 tons
Paper	1,175 tons	1,186 tons
Cardboard	977 tons	1,548 tons

Wastewater

Wastewater : Amount discharged to sewage or public waters

Classification	Our four factories	Group
Wastewater	1,125,934 tons	1,441,242 tons

Basic philosophy on environment

Environmental declaration (revised April 2004)

The Nittoku Group will strive for harmony with society and the global environment while serving the people of the world, offering new value based on the principle of high quality throughout the entire life cycle of our environmentally friendly NGK spark plugs and NTK new ceramic products.
To achieve this, we have formulated an environmental action plan based on our environmental policy as a way of accepting our social role and responsibility as a trusted corporation. With the participation of everyone concerned, we will pursue the development of a sustainable society and business operations.

Environmental policies (revised April 2004)

Management

We will abide by all laws, regulations, protocols and voluntary standards relating to environmental conservation. We also aim to increase our environmental efficiency by continually trying to enhance our environmental management system (EMS) and performance.

Factories /offices

We will remain constantly aware of the need for environmental harmony, working to prevent air, earth and water pollution, use energy and resources more effectively, and reduce waste materials.

Products

We will work towards the development, design, procurement, manufacture, sale, distribution and disposal of environmentally friendly products.

Communication

We will promote communication with stakeholders through clear disclosure of information. We will also contribute not only to local communities but to the wider society through consideration for the natural environment as well as participation and support for environmental conservation activities.

Mind

We will strive to raise awareness of environmental conservation through environmental education and publicity activities as well as the dissemination of these policies among all our employees. We will also seek the understanding and cooperation of our business associates.

	Item
Management	Environmental management system
	Environmental operations
	Environmental accounting
	Environmental risk
	Compliance
Factories /offices	Energy
	Waste matter
	Water resources
	Green purchasing
	Hazardous substances
Products	Eco-design
	Green procurement
	Distribution
Communication	Disclosure
	Community
	Natural environment
Mind	Education and instruction

Environmental action plan and NGK Spark Plug Group Eco Vision 2010 (drawn up in April 2004)

*See the respective pages for details of progress

○ : On schedule × : Delayed

Targets for 2004 – 2005	Progress in FY2004		Eco Vision 2010
Achieve 2004-2005 targets ahead of Eco Vision 2010	○		● Sharing of environmental policies by related companies including overseas
Promote certification of Japanese offices and overseas affiliates	○	P.13	● Centralization of environmental management data control
Promote combination with QMS and OHSMS	○		● Construction of total management system (QMS, EMS, OHSMS)
Introduce eco-efficiency for warming	○	P.18	● Promotion of CSR management
Investigate and research Kyoto mechanism	○		● Reflection of environmental performance in business evaluation
Promote construction of environmental management data system	*1 ○		
Introduce environmental accounting to Group B	○	P.17	● Integration of environmental accounting and management accounting
Investigate and research material flow cost accounting	*2 ×		
Zero environmental accidents and environmental complaints	5 cases	P.15	
Zero cases of environmental law violation	7 cases	P.15	
Construct CSR management system	○		
Reduction of 1% in CO_2 emissions (compared with FY2001) - FY2005 → Manufacturing divisions emissions per unit of resources down 4% → Non-manufacturing divisions emissions down 4%	×	P.19	● Compliance with Kyoto Protocol ● Total greenhouse gas emissions in Japan of 150,000 tons or less (down 10% on FY2001)
Introduce clean energy	*3 ×	P.20	
Achieve zero emissions (min. 98% rate of effective utilization) - FY2005 → Groups A and B	○	P.21	● Zero emissions achieved by related companies including overseas
Reduce waste emissions (compared with FY2003) - FY2005 → Four NGK Spark Plug factories Total emissions down 10% → Groups A and B Total emissions down 5%	×	P.21	● Efficient use of resources in circulation type society ● Waste emissions of 12,000 tons or less (down 30% on FY2003)
Investigate and research the reuse and recycling of used products	○		
Study changing to internal treatment of waste matter	○		● EPR (extended producer responsibility) operations
Reduce use of tap water and well water - FY2005 → Four NGK Spark Plug factories Total used down 10% → Groups A and B Total used down 5%	○	P.22	
Improve eco-efficiency of office supplies etc. - FY2005 → 90%	○	P.22	
Reduce emissions of substances subject to PRTR law - FY2005 → Four NGK Spark Plug factories Total emissions 8.3 tons (down 50% on FY2002) → Groups A and B Total emissions per unit of resources down 20% on FY2001	○	P.24	● Total emissions of substances subject to PRTR law of 36 tons (down 80% on FY2002)
Disuse all substances harmful to the ozone layer end of FY2005	○	P.24	● Construction of management system for environmental pollutants
Not use prohibited substances ranked as hazardous	○	P.23	
Spread LCA procedures throughout company	○	P.28	● Environmentally friendly design and product creation
Introduce eco-efficiency	*2 ×		● Development of eco-business
Introduce environmental labels	*2 ×		
Introduce green supplier system	○	P.23	● Green supplier system of identification and registration of all our business associates
Centralize transportation fuel management	○		● Construction of efficient distribution system
Promote replacement with eco-cars	○	P.22	
Social environmental reports Issue annually	○	P.29	● Disclosure of clear environmental data
Site reports Issue annually	○	P.29	
Hold stakeholder meetings	○		● Continuous issue of CSR reports
Promote acceptance of environmental visits to factories	○	P.29	
Exchanges with NGO and NPO organizations	○		● Support and participation in NGO and NPO activities
Continuous implementation of regional clean-up activities	○	P.29	
Participate in environmental exhibitions and environment-related events	○	P.29	● Promotion of nature conservation and social contribution
Promote greening of factories	○	P.29	
Promote introduction of environmental education programs	*2 ×		● Employee education full of environmental ideas
Environmental conferences Hold annually	○	P.30	
Environment page in company magazine Include every month	○	P.30	

*1: Due to the introduction of an environmental management information system and the start of operations, the target of "promoting establishment" has been revised to "introduction". *2: Scheduled for FY2005.
*3: In the formulation of the roadmap for the reduction of greenhouse gases, the introduction of green energy will be also considered as a method in view of investment efficiency and social trends.

Chapter 1 Management

Environmental management system

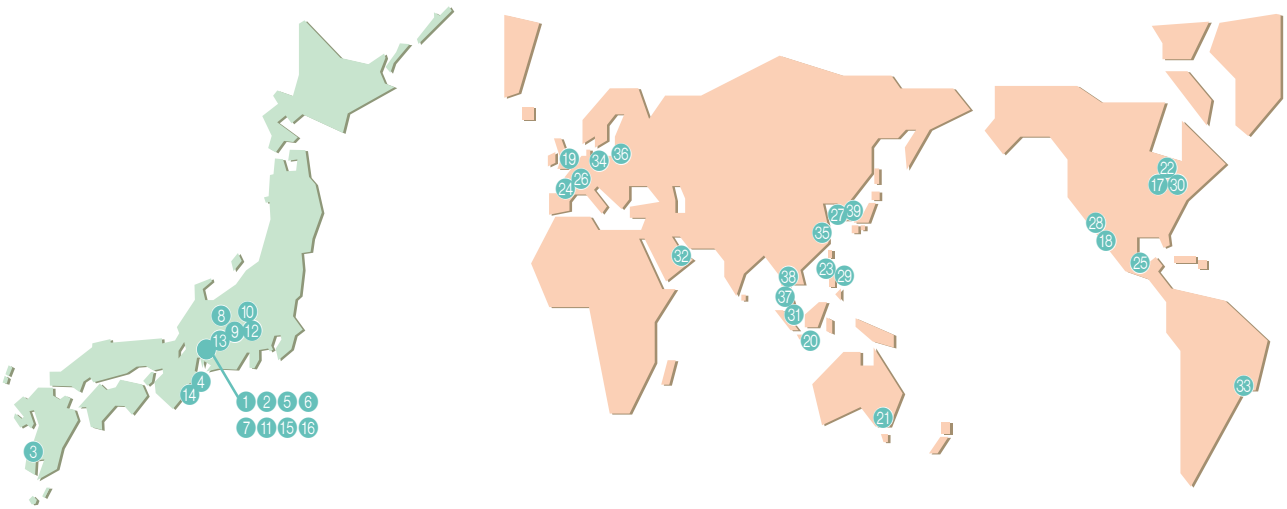
Acquisition of ISO 14001 certification

The NGK Spark Plug Group is utilizing the ISO 14001 environmental management system (EMS) as an important tool to drive forward our environmental management. Both our environmental protection system and performance (goal attainment) have been improving continually since the joint certification of four NGK Spark Plug factories in December 2000. As for our domestic consolidated subsidiaries, 11 companies have been included in the expansion of our ISO 14001 joint certification as of January 2004, and we are pursuing uniform management to share common goals and information. Although our overseas consolidated subsidiaries are currently preparing for certification independently, we also plan to expand certification and develop our EMS based on a common environment preservation policy.

	Name of factories and companies	Timing of certification	Certification organization	Number of employees
NGK Spark Plug	1 Head Office/Factory	'99. 8	TÜV Rheinland Japan	1,081
	2 Komaki Factory	'00.12		2,684
	3 Miyanojo Factory	'00.12		546
	4 Ise Factory	'00.12		384
Consolidated subsidiaries (domestic)	5 Nittoku Seisakusho Co., Ltd.	'04. 1	TÜV Rheinland Japan	104
	6 Nittoku Unyu Co.,Ltd.	'00.12		18
	7 Nichiwa Kiki Co.,Ltd.	'04. 1		59
	8 Kamioka Ceramic Co., Ltd.	'04. 1		143
	9 Kani Ceramic Co., Ltd.	'02.12		155
	10 Iijima Ceramic Co., Ltd.	'02.12		448
	11 Nittoku Alpha Service Co.,Ltd.	'99. 8		124
	12 Nakatsugawa Factory Co., Ltd.	'02.12		441
	13 Tono Ceramic Co.,Ltd.	'04. 1		106
	14 Nansei Ceramic Co.,Ltd.	'02.12		52
	15 Ceramic Censor Co., Ltd.	'00.12		431
	16 Tokai Taima Kogu Co.,Ltd.			35
Consolidated subsidiaries (overseas)	NGK Spark Plugs (U.S.A.) ,Inc. 17 West Virginia Factory 18 Irvine Factory	'00. 7 '00. 8	TÜV Rheinland of North America	482
	19 NGK Spark Plugs (U.K.) Ltd.	'01.12	BSI (British Standard Institute)	72
	20 P.T. NGK Busi Indonesia			333
	21 NGK Spark Plug (Australia) Pty. Ltd.			36

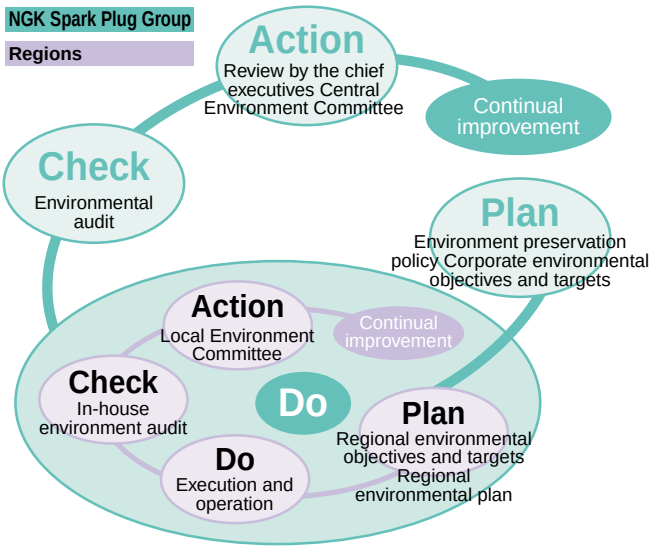
	Name of factories and companies	Timing of certification	Certification organization	Number of employees
Consolidated subsidiaries (overseas)	22 NGK Spark Plugs Canada Limited			37
	23 Taiwan NGK Spark Plug Co., Ltd.			29
	24 NGK Spark Plug Industries Europe S.A.S.	'00. 5	AFAQ	45
	25 Bujias NGK de Mexico S.A. de C.V.			51
	26 NGK Spark Plugs (France) S.A.S.			33
	27 NTK Cutting Tools Korea Co., Ltd.			57
	28 NTK Technologies ,Inc.			50
	29 NTK Technical Ceramics (Taiwan) Ltd.			6
	30 NGK Spark Plugs (U.S.A.) Holding, Inc.			—
	31 NGK Spark Plugs Singapore Pte Ltd			7
	32 NGK Spark Plug Middle East FZE			11
	33 Ceramica e Velas de Ignicao NGK do Brasil Ltda.	'01.12	ABS Quality Evaluations	1,103
	34 NGK Spark Plug Europe GmbH	'04.11	TÜV Industrie Service	183
	35 NGK Spark Plug (Shanghai) Co.,Ltd.			89
	36 NTK Technical Ceramics Polska Sp.zo.o.			54
	37 NGK Spark Plugs Malaysia Berhad.			108
	38 Siam NGK Spark Plug Co., Ltd.	'02.11	RW TÜV	181
	39 Woo Jin Industry Co., Ltd.	'05. 4	kfq(Korean Foundation for Quality)	217

*Number of employees as of March 2005

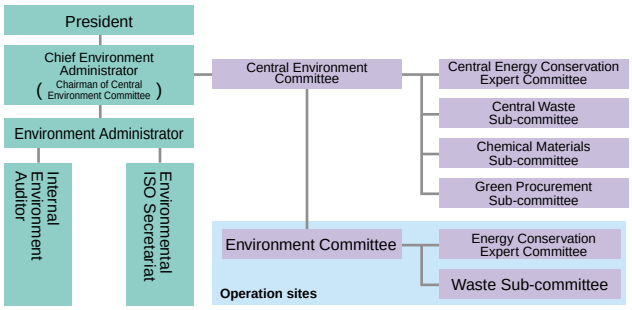


System operation

The NGK Spark Plug Group's EMS is based on the participation of all our employees in order to implement our activities. We operate a PDCA (Plan-Do-Check-Action) cycle throughout the entire group and in each region (factory), and verify the performance status of the objectives and the goals of the entire group as well as each region during a management review conducted by the chief executives.
An internal environmental audit is conducted annually to verify and evaluate the compliance of our self-regulation in addition to the operating status of the system and the observance of the law. We are also striving to enhance the awareness of our internal environmental auditors and promote exchange between different sections, through activities such as having auditors go and audit other sections.



Environmental Activity Promotion Organization



* "Operation sites" means the Head Office Region, Komaki Region, Miyanojo Region, Ise Region and affiliates.



Number of ISO14001 auditors

	Four NGK Spark Plug factories	Affiliates
ISO14001 assistant examiners	6	0
ISO14001 Internal auditors	293	146

Column

Oversea Plant Environmental Protection Activities

NGK Sparks Plugs (USA) Inc., West Virginia Factory



NGK-W.V. operations include manufacturing of the Oxygen Sensors and distribution center for North America. In July 2000, it became the second NGK overseas facility to be ISO 14001 certified. W.V. plant routinely complies with the US Federal and W.V. State laws and regulations. Honda, one of our customers, has recognized our performance.
On June 16, 2005 WV State Dept. of Environment awarded 2004 Excellence Award only to NGK within "Small Quantity Generator" (of hazardous material) category.

1994	Established as NGK Manufacturing U.S.A. INC
2000	ISO14001 certified
2002	NGK Spark Plugs (U.S.A.), INC. and NGK Spark Plug MFG. (U.S.A.), INC. were reorganized to form NGK Spark Plugs (U.S.A.), INC. and NTK Technologies, INC. to reflect their product lines.





NGK-WV Environmental Policy

NGK-WV is committed to protecting the environment and conserving resources by:

- Complying with regulations
- Preventing pollution & waste
- Improving objectives & targets



Emergency Action Plan

Detailed instructions are published for associates to follow in case of an emergency such as Shelter in place, which may be caused by a chemical leak from nearby chemical plant. The room (pictured on left) is one of many such shelters.



MSDS

MSDS is made available throughout the facility with networked work stations. Assocaite can print MSDS on demand. This system helps us to comply with OSHA's Right to Know regulation.



Recycle Day Nov 13, 2004

NGK booth was a big part of the Recycling Awareness Campaign organized by local governmental agency.



Adopt-A-Highway

Adapt the segment of the highway to voluntarily pick up the trash.





2004 Recycle Material Fashion Show

Upon winning the internal recycled material competition, these two NGK entries won the 1st and 3rd prize at the regional competition.

Environmental risk

Business activities involve various environmental risks, and we are making efforts to reduce such risks through proper management on a regular basis. To deal with the risks of air pollution and water pollution, we have concluded an agreement on pollution control with municipalities and implemented self-regulation that is stricter than the law, with which we also comply. In handling the risk of soil contamination, we take preventive measures such as installing aboveground piping, and conduct pollution surveys on estate we plan to purchase.

Soil survey

We purchased an estate in FY2004 that had been used as a warehouse. Although the estate had no record of use of hazardous materials, the state of pollution was surveyed just in case any pollution had been generated before the estate became a warehouse.



PCB control

The Head Office Factory and Komaki Factory store high-voltage condensers and ballast for fluorescent lamps containing PCBs (polychlorinated biphenyls). We continue strict control right up until the treatment of stored PCB waste is properly completed under the national PCB waste treatment program.



Drill to practice emergency procedures

To prepare for emergency situations such as equipment malfunction due to earthquake and fire, we hold drills depending on the business activities of each area.





Compliance

To ensure thorough compliance in business activities, we strive to conform to environmental laws based on our environmental policies. We handle violations and complaints under our ISO 14001 system according to the prescribed procedures, and have taken countermeasures against violations and complaints in the last three years. We will continue to fully investigate and publicize all violations and complaints and take the appropriate measures.

Four NGK Spark Plug factories No. of violations/complaints

	FY2002	FY2003	FY2004
Violations	*1 1	0	0
Complaints	*2 1	0	*3 4

* 1 : The noise level (at night) exceeded the regulation level at the Head Office Factory.
* 2 : A waste disposal contractor made a complaint to the Head Office Factory requesting an improvement in the mixing of foreign matter in waste.
* 3 : Two complaints were made both to the Head Office Factory and Komaki Factory requesting an improvement in noise levels.

Affiliates No. of violations/complaints

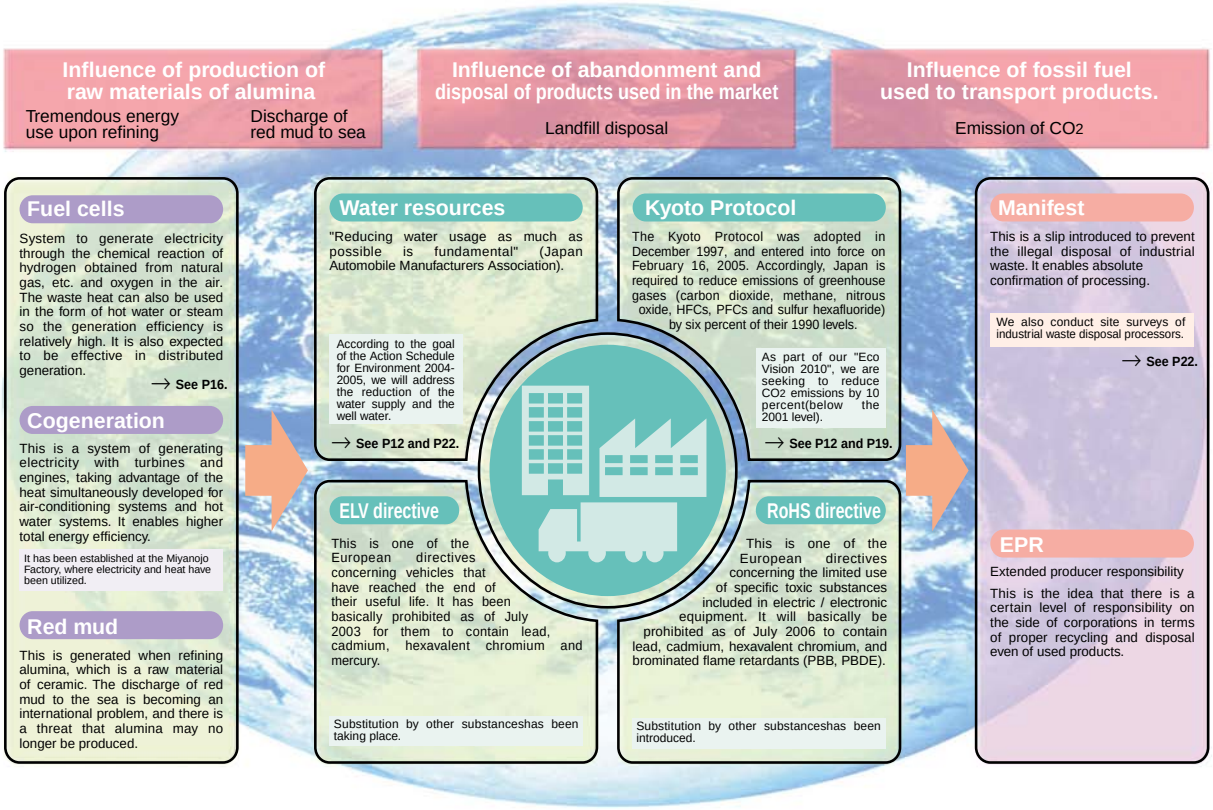
	FY2002	FY2003	FY2004
Violations	*4 *5 6	*6 *7 3	*8 *9 7
Complaints	*10 3	*11 1	*12 1

* 4 : The noise level exceeded the regulation value at Kani Ceramic.
* 5 : At Nittoku Seisakusho, the noise level exceeded the regulation value (3 cases), the trichloroethylene level in effluent exceeded the regulation value, and BOD and COD exceeded the more stringent standard set by Aichi Prefecture.
* 6 : The noise level exceeded the regulation value at Kani Ceramic.
* 7 : The noise level and oil level exceeded the regulation levels at Nichiwa Kiki.
* 8 : The noise level exceeded the regulation values at Kani Ceramic, Kamioka Ceramic and Nittoku Seisakusho (2 cases).
* 9 : At Ceramic Sensor, the nitrogen level and COD in effluent exceeded the value agreed on with Komaki City, and the fluorine level exceeded the regulation value.
* 10: Complaints were made respectively to Iijima Ceramic, Kani Ceramic and Nittoku Seisakusho requesting an improvement in noise levels.
* 11: A complaint was made against Nittoku Seisakusho requesting an improvement in noise level.
* 12: A complaint was made to Ceramic Sensor requesting an improvement in the disposal of cigarette butts.

Column

Environmental challenges and eco-words surrounding the NGK Spark Plug Group

The world is seeking to establish a sustainable, recycling-oriented society. The entry into force of the Kyoto Protocol and the enhancement of chemical control are part of this movement. In addition to the pursuit of economic growth, companies have to fulfill their social responsibilities through environmentally friendly and sustainable business activities. Here we show some environmental terminology in columns and illustrate the environmental challenges faced by us along with our environmental conservation activities toward Eco Vision 2010.



Sustainability
It is to grow and develop the society continually without sacrificing the living standard in the future. It can also be said, "Possibility for Sustainability".

CSR
Stands for corporate social responsibility. This is the concept of companies having to fulfill their responsibilities on environmental, economic and social issues. Environmental management balancing these three is required.

Compliance
This means to observe regulations.
→ See P15.

Stakeholders
Communication will enhance mutual understanding.
→ See P29.

History of environment conservation

Feb. 1973	Safety and Environment Section (present Environment & Safety Management Dept.) was established. Safety and Sanitation Committee and Antipollution Committee were established.
Mar. 1974	Antipollution agreement was concluded between Komaki Factory and Komaki City.
Apr. 1980	Antipollution agreement was concluded between Miyanojo Factory and Miyanojo Town. Energy Conservation Expert Committee was established.
Nov. 1980	Miyanojo Factory introduced a closed wastewater treatment system to its plating plant.
Nov. 1993	Antipollution agreement was concluded between Ise Factory and Ise City.
Apr. 1994	Ise Factory introduced a closed wastewater treatment system to its plating plant.
Apr. 1999	Environment declaration was announced.
Jun. 1999	Reorganization of Antipollution Committee into Environment Committee. Environmental management system was reviewed and Energy Conservation Expert Committee was organized.
Aug. 1999	Head Office/Factory obtained ISO14001 certification.
Oct. 1999	Waste Sub-Committee, Green Procurement Sub-committee, and Chemical Materials Sub-committee were established.
Sep. 2000	The first edition of ECO report was issued.
Dec. 2000	Combined ISO14001 certification covering the company's entire operation sites (Head Office/Factory, Komaki, Miyanojo and Ise)
Jun. 2001	The first environment convention was held.
Jul. 2001	Cogeneration plant was installed in Miyanojo Factory and utilization of plating plant waste heat was commenced.
Sep. 2002	Miyanojo Factory achieved zero emission.
Dec. 2002	Combined ISO14001 certification covering Nittoku Group and affiliates (Iijima Ceramic, Nakatsugawa Ceramic, Kani Ceramic and Nansei Ceramic)
May. 2003	Voluntary soil survey and soil improvement was performed on the company premises and reported to Nagoya City. Head Office/Factory and Komaki Factory achieved zero emission.
Sep. 2003	Ise Factory achieved zero emission.
Jan. 2004	Combined ISO14001 certification covering Nittoku Group and affiliates (Kamioka Ceramic, Nittoku Seisakusho, Nichiwa Kiki and Tono Ceramic)
Oct. 2004	Nittoku Seisakusho and Ceramic Sensor achieved zero emission.
Mar. 2005	Nansei Ceramic achieved zero emission.

Environmental accounting

For the effective promotion of environmental management, it is important to measure the environmental conservation cost and its effect in a quantitative manner. We introduced environmental accounting from FY1999, and expanded the scope to cover the group in FY2003.
The environmental conservation cost in FY2004 was 8,401 million yen in four Nittoku factories and 8,967 million yen in the group, an increase of approximately 5%.
The effect of environmental conservation measures taken in FY2004 was 234 million yen on a non-consolidated basis.

Environment preservation cost

Unit: million yen

Items			Four NGK Spark Plug factories				Group	
Classification		Major efforts	Investment		Expense		Investment	Expense
			2003	2004	2003	2004	2004	
Costs within the business area	Pollution prevention cost	Air/water pollution prevention and noise reduction	180	80	1,064	952	118	1,171
	Global environmental conservation cost	Global warming prevention, energy conservation	2	4	70	69	10	112
	Resource circulation cost	Effective resource utilization, industrial waste treatment/disposal	28	37	424	520	47	694
		Sub-total	211	121	1,557	1,541	174	1,977
Upstream & downstream cost		Recycling of products, etc., green purchase differences	0	0	4	4	0	4
Management activity cost		Employee environmental education, EMS construction and operation	4	4	345	403	7	470
R&D cost		R&D of products promoting environment preservation	529	657	5,199	5,433	657	5,433
Social activity cost		Nature protection, afforestation, environmental ads	0	0	173	188	0	196
Environment damage correction cost		Repair of soil contamination, disrupted nature	0	0	3	14	0	14
Other costs		-	0	4	0	32	4	32
Total			743	786	7,282	7,616	841	8,125

The environmental conservation cost is classified according to the "Environmental Accounting Guidelines 2002" published by the Ministry of the Environment.
The cost is calculated on a pro-rata basis, based on the records of direct capital investment and cost, according to our independently set rules.

Environmental conservation effect measurements

Classification		Four NGK Spark Plug factories				Group
Effect measured in the business area	Types of effect	2003	2004	Year-on-year (%)	Rating	2004
Effect measured with respect to resource input into operations	Energy consumption					
	Purchased electricity (10,000 kWh)	18,231	19,178	5.2	×	30,379
	Gas (10000 m^3)	1,447	1,398	−3.4	△	1,462
	LPG (10000 m^3)	168	181	8.0	×	395
	Grade A crude oil (KL)	2,793	2,794	0.0	△	2,794
	Water consumption					
	Tap water (tons)	728,127	730,869	0.4	△	915,553
	Well water (tons)	893,326	970,565	9.0	×	1,101,211
	PRTP law-regulated substance consumption (tons)	453	544	20.2	×	824
Effect measured with respect to environmental load and waste from business activities	CO_2 emission from energy consumption (tons)	114,928	117,603	2.3	△	169,214
	Emission per unit production (CO_2/output added value) (tons/million yen)	1.143	1.150	0.6	△	---
	Recycled plant wastewater (tons)	851,646	* 969,593	13.8	-	1,102,682
	Waste					
	Recycled mass (tons)	14,327	15,982	18.9	○	18,305
	Landfill, incineration (tons)	105	89	−15.3	○	535
	PRTR law-regulated substances released into air and water (tons)	16	16	5.6	×	174

*The definition of recycled water has been modified to mean water reused after wastewater treatment.
*The following marks indicate a performance rating compared with the previous fiscal year - ○: improvement of 5% or more; △: fluctuation of +/- 5%; and ×: deterioration of 5% or more.

Effect of environment conservation measures shown in yen

Unit: million yen

Area of recognized effect		Four NGK Spark Plug factories
Revenue	Revenue generated from the recycling of waste generated in operations or used products	115
Cost saving	Energy cost saving achieved from energy conservation efforts	82
	Waste disposal cost saving achieved by resource conservation and recycling efforts	37
Total		234

Environmental management

Eco-efficiency

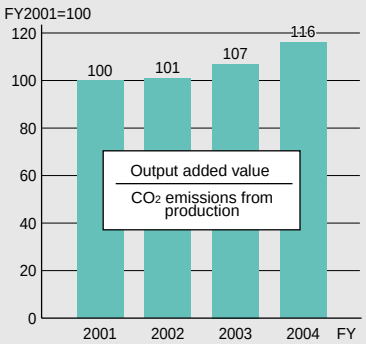
Environmental efficiency is an index representing the ratio of the economic value creation to the environmental impact of a company's business activities. For their sustainable development, companies have to minimize their environmental impact while maximizing their economic value, and the improvement of environmental efficiency is an important challenge.
We also assess CO_2 emissions and the amount of waste generated to assess the environmental efficiency, and promote environmental management.

Our Eco-efficiency

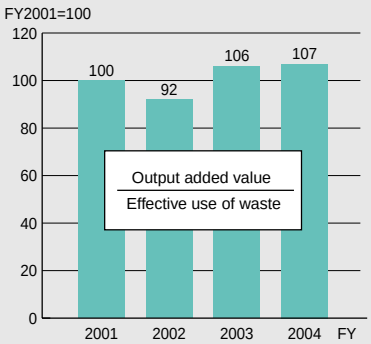
$$\text{Eco-efficiency} = \frac{\text{Output added value}}{\text{Environmental load}}$$

* The output added value is calculated by subtracting material costs and the costs of outsourced processing from sales.

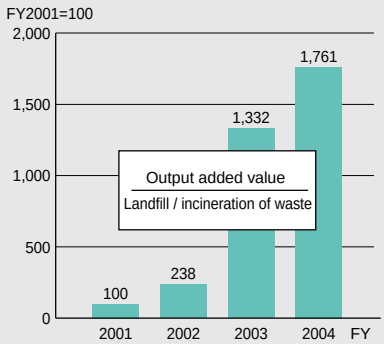
CO_2 index from production
(Four NGK Spark Plug factories)



Index of effective use of waste
(Four NGK Spark Plug factories)



Index of landfill/incineration of waste
(Four NGK Spark Plug factories)



Column

Environmental management rating and assessment

In order to logically and objectively evaluate the reality of the environmental management of corporations from the perspective of building a sustainable society, an "environmental management rating" has been conducted since FY2002 by the Sustainable Management Forum of Japan and the Sustainable Management Rating Institute.
We participated in the third environmental management rating in FY2004, our second time following participation in FY2003, in order to achieve our goal of being evaluated as a sustainable company.

Survey Content	
	Interview with corporate executives
	Answer to survey sheet Three categories, 23-evaluation phases and 207 questions
	Hearing Confirmation of the itemsdescribed in the survey sheet

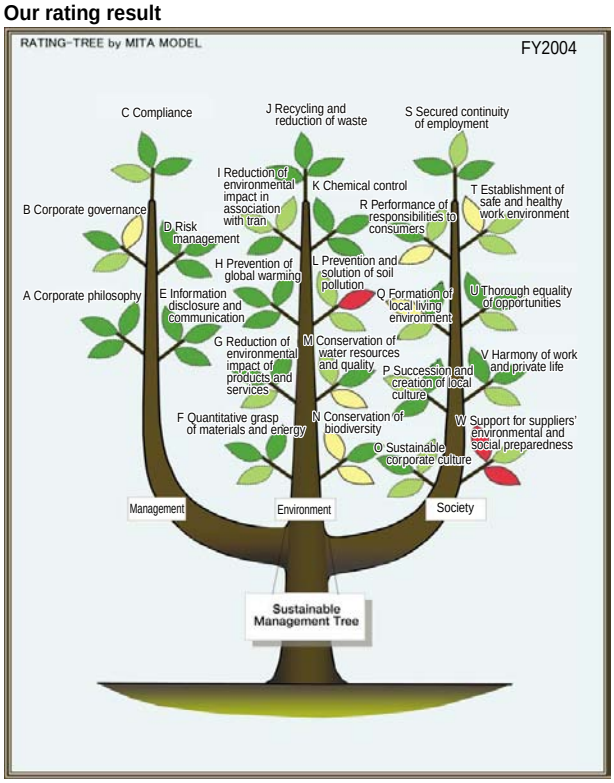
In the environmental management rating in FY2004, in which 64 companies participated, the management and social aspects were emphasized and more questions asked on CSR (corporate social responsibility). Results are illustrated by five levels of leaves on a tree, with more green leaves meaning better environmental management of the company.

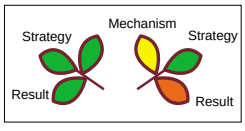
Our president was interviewed in January 2005 and the final results were published on March 25. The tree of NGK Spark Plug Group is shown on the right. Our tree had no fallen leaves but some red leaves on the two evaluation aspects of "prevention and solution of soil pollution" and "support to suppliers in their environmental and social preparedness."
We acknowledge these aspects evaluated with red and yellow leaves as our future challenges, and will strive to improve them for better environmental management.

Evaluation		Number of leaves
	Reached a sustainable level	39
	Almost reached a sustainable level	20
	On the way to reaching a sustainable level	7
	Doubtful to reach a sustainable level	3
	Difficult to reach a sustainable level	0

Evaluation subjects		Number of companies evaluated/total
Domestic	Most consolidated companies	12/13
Overseas	Main consolidated companies	6/23

Our rating result





Sustainable Management Rating Institute
http://www.smri.jp/

Chapter 2 Factory/Office

Energy

Approach to global warming

For the prevention of global warming, it is important to reduce the total emissions of greenhouse gases. We have set the target of reducing our domestic emissions of greenhouse gases to 150,000 tons (10% below the FY2001 level) by FY2010 in the "NGK Spark Plug Group Eco Vision 2010." We will promote activities to meet this goal, such as the rationalization of processes and introduction of high-efficiency equipment. We will also calculate the emissions of greenhouse gases other than CO_2 accurately for effective reduction activities.



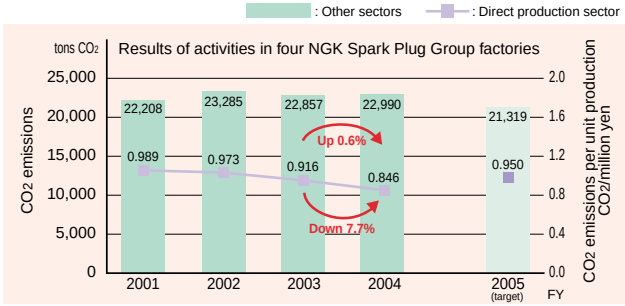
Central Energy Conservation Expert Committee
Shigeyasu Yamada, Chairman/Director

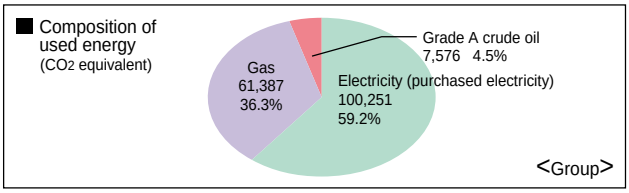
Results compared to targets in FY2004

We have set the following (FY2005 and yearly) targets since FY2002 and promoted activities and measures accordingly.

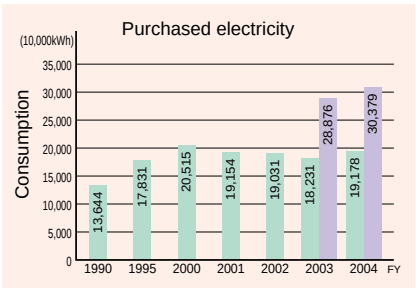
		Target for FY2005	Target for FY2004	Result in FY2004 (four NGK Spark Plug factories)
Direct production sector	Emissions per unit production	▲ 4% (from FY2001)	▲1% (from FY2003)	▲7.7% (from FY2003)
Other sectors	Emissions	▲ 4% (from FY2001)	▲1% (from FY2003)	+0.6% (from FY2003)

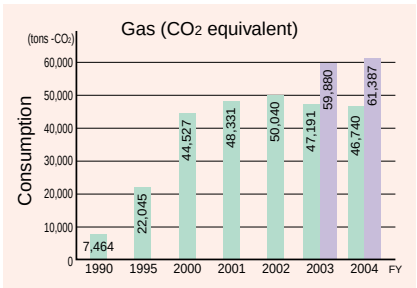
In FY2004, we developed our "no necktie" campaign and other measures in other sectors, but failed to achieve the target due to the impact of the heat wave that summer.

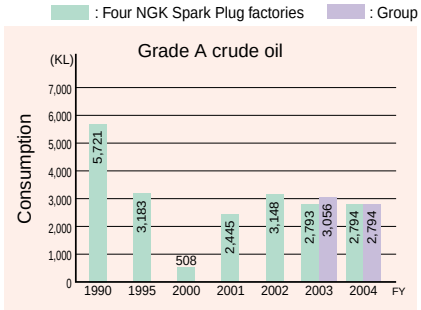




Energy use by year



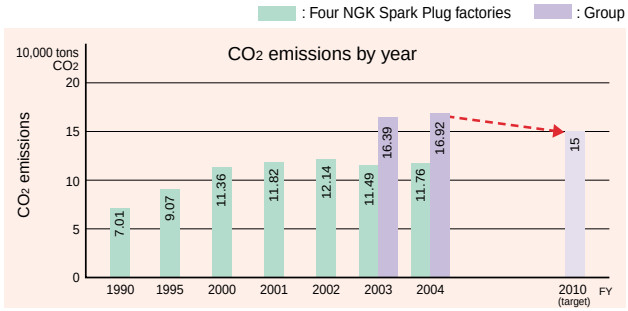




* The consumption of crude oil increased because of the introduction of a cogeneration system at Miyanojo Factory in FY2001.

Eco Vision 2010

CO_2 emissions from the energy consumed for production by us in FY2004 totaled 169,000 tons. Looking at CO_2 emissions in our four factories over time, emissions have increased by 68% since production was increased by 127% even though emissions per unit production have decreased by 26% from the FY1990 level. We aim to achieve our Eco Vision 2010, and have prepared a roadmap for the period to 2010 to efficiently and effectively reduce CO_2 emissions on a group-wide basis.

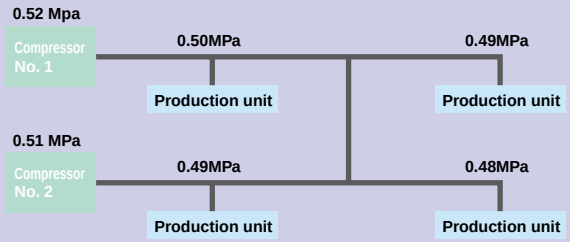


Examples of energy conservation

Many devices in our production units require air (compressed air) for their operation. As the use of a compressor to produce this air, which is distributed to the production units through pipes, consumes a large amount of electricity, we have made efforts to improve the air distribution process at our Head Office Factory.

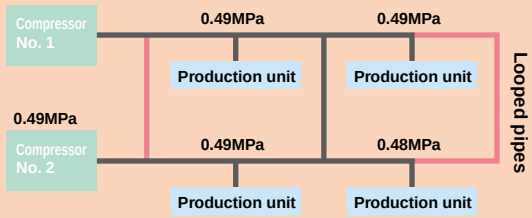
Before action

It is necessary to maintain a certain level of air pressure to deliver air from a compressor to the most distant production unit. To allow for the decline of pressure in pipes, the air had to be produced under high pressure conventionally.



After action

Looped pipes are used for more effective use of the air. The compressors, which used to be operated manually on an hourly basis, are now automatically operated.



Result

The distribution system has been improved to be able to maintain a certain level of pressure until the air reaches the most distant unit even if the air pressure produced in the compressors is lower, so the power consumption of the compressors has been reduced by 6%.

In addition, we engage in the reduction of power consumption of the compressors through the prevention of air leaks, and implement inspections twice a year to detect and repair air leaks.

	Power consumption of compressors
FY2003	1,995,000 kWh
FY2004	1,879,000 kWh

Reduction of CO_2 emissions by 38 tons

Clean energy

We installed photovoltaic generation panels on the rooftop of the main building of our Head Office in October 2003. The electric power generated is used for air-conditioning and illuminating the product exhibition panel in the showroom on the first floor of the main building.



Outline

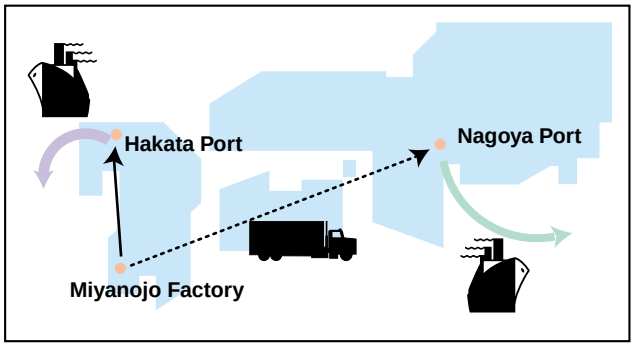
Power generation capacity (maximum sustained power)	10kW
Battery module	167w-60 panels
Installation area	5x15.2m

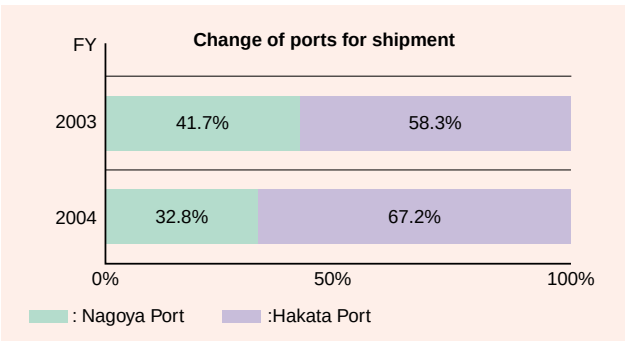
Performance in FY2004

Power generation	Approx. 13,000 kWh
CO_2 reduction	Approx. 4.3 tons CO_2

Distribution

Miyanojo Factory manufactures spark plugs, our main product, many of which are exported overseas. While they were traditionally transported by land to Nagoya Port and then shipped, shipment from Hakata Port can reduce the transportation distance and time, depending on the destination. As a result of the rationalization of distribution, the ratio of exports via Hakata Port was gradually increased, and in FY2004 such exports grew by 8.9% over the previous year. Diesel oil consumption fell by 21 KL and CO_2 emissions were reduced by 55 tons.





Waste

Effective use of resources

We dispose of waste properly in order to use resources as effectively as possible. In particular, in order to reduce the environmental impact of waste, we handle waste in the following order of priority:

(1) Reduction (2) Reuse (3) Recycling (4) Landfill/Incineration

Each business site of our group is working for the achievement of zero emission by FY2005. The factories that have already attained zero emission now focus on further increasing the ratio of internally reused raw materials and reducing waste to minimize input materials in the material balance.
Although various business sites have attained zero emission, waste generation has increased by 15.8% over the last year as a result of production growth.

Results of efforts in FY2004

	Waste generation in FY 2003 (tons)	Waste generation in FY 2004 (tons)	Reduction rate in FY2004 (%)	Date of achieving zero emission
Head Office/Factory	899.8	901.0	0.1	May 2003
Komaki Factory	8,412.2	10,560.8	25.5	May 2003
Miyanojo Factory	3,056.8	3,056.8	0.0	September 2002
Ise Factory	2,063.6	1,552.0	−24.8	September 2003
Iijima Ceramic	1,098.8	1,144.5	4.2	
Nakatsugawa Ceramic	362.3	340.5	−6.0	
Kani Ceramic	74.5	114.9	54.1	
Nansei Ceramic	49.1	47.5	−3.1	March 2005
Kamioka Ceramic	102.5	94.4	−7.9	
Nittoku Seisakusho	230.7	220.8	−4.3	October 2004
Nichiwa Kiki	4.0	6.6	62.1	
Tono Ceramic	16.2	14.7	−9.2	
Ceramic Sensor	811.6	785.3	−3.2	October 2004
Total	17,182.3	18,839.7	9.6	

Definition of effective use

We commit external contractors to reuse and recycle the valuable parts of the waste generated from our factories (including the recovery of heat), and calculate the amount as the waste effectively used. This includes the parts of the waste sold as valuable resources.

Definition of zero emission

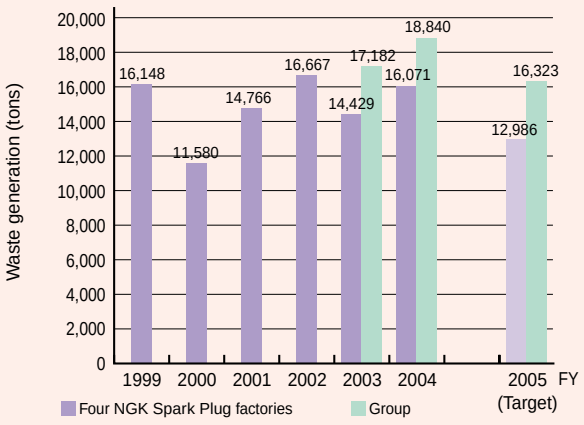
In the NGK Spark Plug Group, zero emission is defined as the state in which the recovery rate of waste, including both industrial waste and general waste from our operations, is at least 98%.

$$\text{Recovery rate} = \frac{\text{Reused or recycled amount}}{\text{Reused, recycled or landfill/incinerated amount}} \geqq 98\%$$

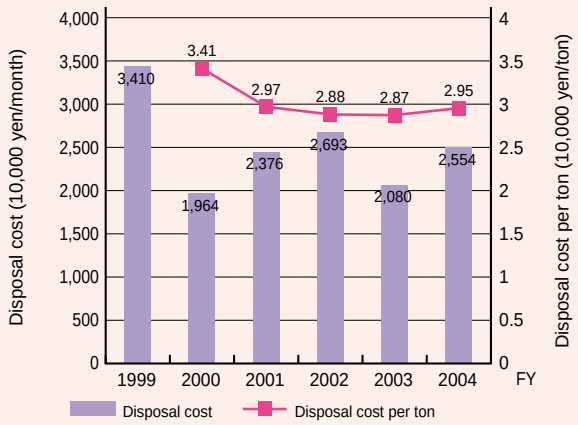
Setting the borderline at 98% for zero emission is to avoid excessive energy consumption that would result from perfectionism to recover garbage such as cigarette butts and tea leaves, which is instead incinerated.

* See "Data section" in P.31 for the waste effectively used, amount of landfill and incineration, a recovery rate of each factory in FY2004.

Waste generation by year



Waste disposal cost (four NGK Spark Plug factories)



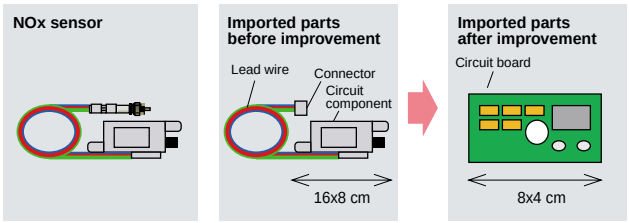
On-site check of waste disposal contractors

To confirm the proper treatment of waste generated by the NGK Spark Plug Group, we conduct on-site checks of the intermediate treatment and final disposal processes. In FY2004, 95 checkers in total visited 50 contractors (48 checkers from the four NGK Spark Plug factories visited 27 contractors) to inspect their treatment and disposal process sites, and confirmed that there was no problem in the way they were controlled.



Example (reduction of waste in NOx sensor production process)

A NOx sensor can measure the NOx level and oxygen level in exhaust gas from diesel-powered vehicles at the same time, and is composed of a sensor body, circuit component and lead wire. Traditionally, the NGK Spark Plug Group manufactured the sensor bodies and assembled them with imported circuit components and lead wires. The circuit parts required secure packaging as they were precision parts, so the packaging materials generated a waste problem. Then, we decided to import only the circuit boards and procure the rest of the parts domestically. Consequently, with a smaller volume of imported parts and less use of cardboard boxes for packaging, we have succeeded in reducing packaging waste by as much as 79%.



Waste generation before and after improvement

	Before improvement	After improvement
Cardboard box	334 boxes 290 kg	50 boxes 44 kg
Resin tray	2,000 trays 340 kg	600 trays 102 kg
Connector (to be removed at assembly)	12,000 units 120 kg	0 unit 0 kg
Polystyrene foam	0 box 0 kg	50 boxes 15 kg



Water resources

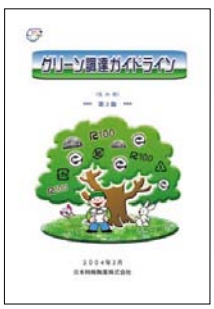
Reduction of the use of tap and well water

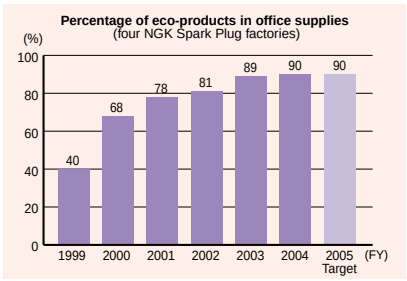
Water is precious resource from the earth. While we have controlled the quality of factory effluent from before, a specific target for the reduction of the use of tap and well water was set for the first time in the environmental action plan formulated in FY2004, as the target for FY2004/2005. In FY2004, we measured the use of tap and well water and the use of recycled water as baseline data for the effective use of water, and are taking measures and preparing new ones.

Green purchasing

Purchase of environmentally friendly office supplies

We also promote the active purchasing of environmentally friendly products (eco-products) in the area of office supplies and commodities. In March 2004, we published the second edition of our "Green Procurement Guidelines (In-house use)" to enhance the awareness of environmental conservation in the workplace. The guidelines show the criteria for purchasing eco-products and a list of targeted products, and set criteria for respective products. As for the four NGK Spark Plug factories, the ratio of eco-products to total purchases reached 90.4% in FY2004, exceeding the target set for FY2005 (90%). We will continue our efforts while striving to extend the list of targeted products. Our affiliate companies are also involved in various activities, having set a target ratio of 90% for FY2005.





* We only considered data on the use of office supplies (stationery) from our warehouse previously, but since FY2004 we have also covered direct purchasing by business departments.

Eco-friendly cars

To reduce the environmental impact of our distribution and sales activities, we are promoting the replacement of company vehicles that are due for renewal with eco-friendly cars. In FY2004, we owned 139 low-emission vehicles that satisfied the "2000 exhaust gas standards" and "2005 exhaust gas standards" under the Ministry of Land, Infrastructure and Transport's low-emission vehicle certification system, representing 61% of our entire fleet.

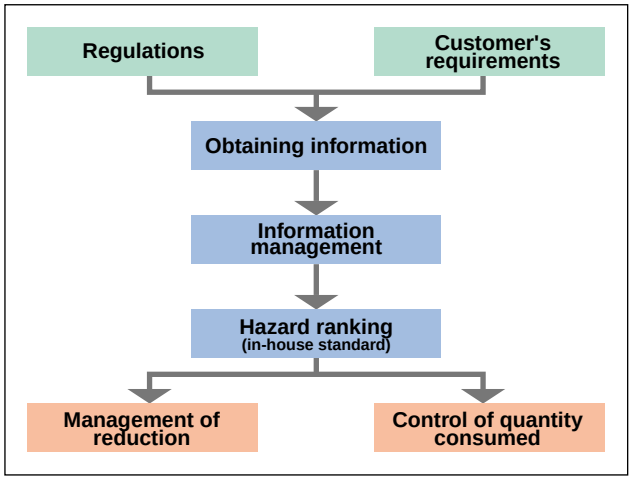
Number of low-emission company vehicles No. of cars

Category		Four NGK Spark Plug factories (including business offices)	Affiliates
Total number of company vehicles		201	26
New ☆☆☆☆	(75%-decreased level in the exhaust gas standards in 2005)	8	1
New ☆☆☆	(50%-decreased level in the exhaust gas standards in 2005)	15	1
☆☆☆	(75%-decreased level in the exhaust gas standards in 2000)	49	3
☆☆	(50%-decreased level in the exhaust gas standards in 2000)	25	3
☆	(25%-decreased level in the exhaust gas standards in 2000)	31	3
	Exempted from exhaust gas regulations	73	15

Hazardous substances/green procurement

Control of hazardous substances

We have established a hazardous material control system to properly control chemicals it uses and prevent environmental pollution. Based on the "hazard ranking" set according to the information obtained on laws and customer demands, we control the use and release of the covered hazardous substances and promote their substitution and reduction.



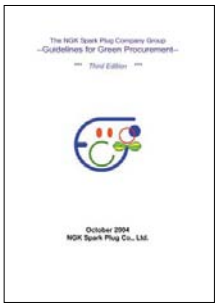
Criteria for handling substances covered by hazard ranking

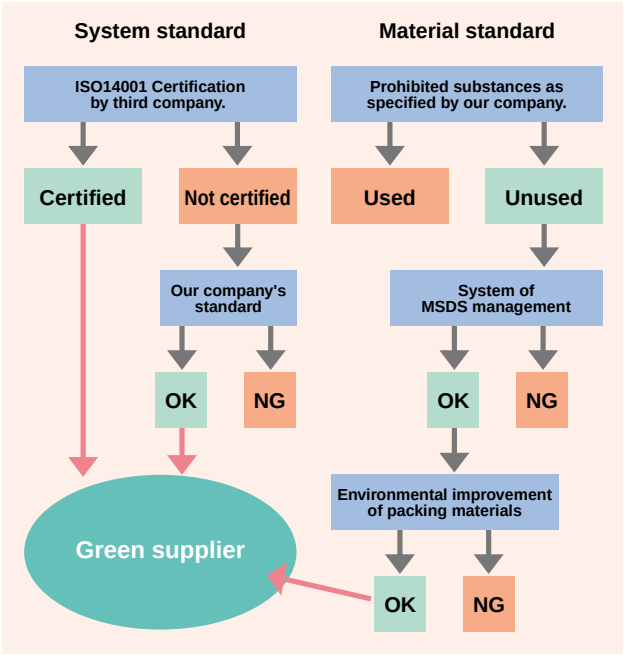
We classify hazardous substances as prohibited, restricted or controlled substances based on our hazard ranking.

Hazard ranking	Handling standard	Substances covered
Prohibited substances	Use is prohibited.	Substances prohibited from use or strongly restricted by regulations
Restricted substances	A substitution program shall be proposed and the substances switched	Hazard level and toxicity are equivalent to prohibited substances, but an immediate hangeover is impossible due to its special characteristics.
Controlled substances	Emission into the environment and transportation upon use are controlled.	Mainly substances subject to PRTR Law

Green supplier system

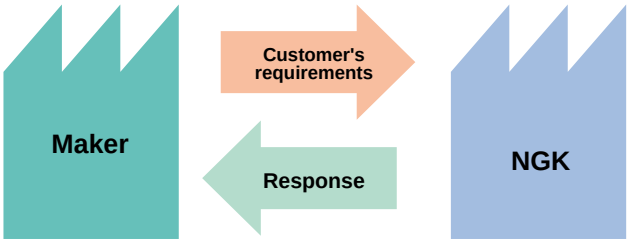
We request suppliers to apply our "Green Procurement Guidelines (for Partners and Suppliers)" in order to procure raw materials and parts with less environmental impact.
To deal with the recent tightening of relevant laws and regulations and the enhanced significance of chemical control in the industry related to us, we published a third edition of our "Green Procurement Guidelines (for Partners and Suppliers)" in October 2004. The third edition sets "system standards", which urge suppliers to establish an environmental management system, and "material standards", which require them to supply raw materials and parts free of hazardous substances. Based on these standards, we will discuss and cooperate on green procurement with our suppliers in order to reduce environmental impact.





Response to demands for green procurement

In line with tightened regulations on chemicals in Japan and other countries, our client makers are also making stricter demands on green procurement.
We are responding to various demands, such as to submit data on chemical contents through an IMDS etc., answer client's questionnaires, submit non-use certificates, and undergo on-site audits.

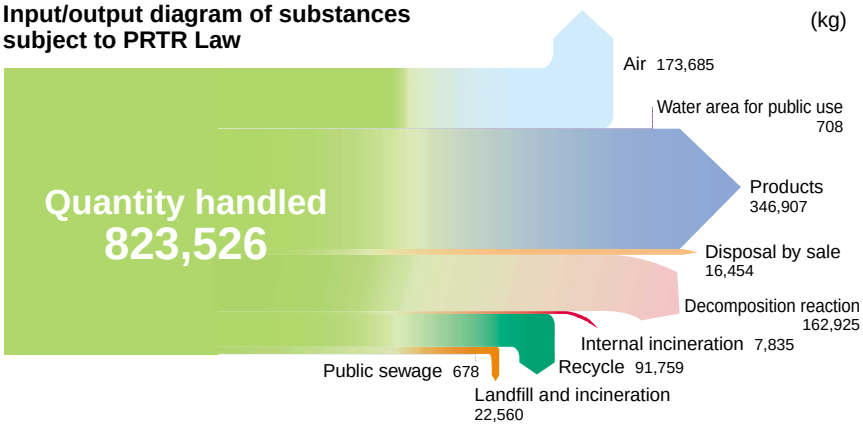


Control of substances subject to PRTR Law

We are promoting the replacement of substances subject to the PRTR Law, with a target of reducing the amounts released into the air and water by 80% from FY2002 levels by FY2010. In FY2004, our factories reported that they had handled 824 tons and released 174 tons of the 27 substances subject to the PRTR Law. Emissions generated by our four domestic NGK Spark Plug factories totaled 16 tons, an increase of 6% over the previous year in concert with an increase in production.

*Only substances (where one ton or more is handled) covered by each workplace's report are shown.

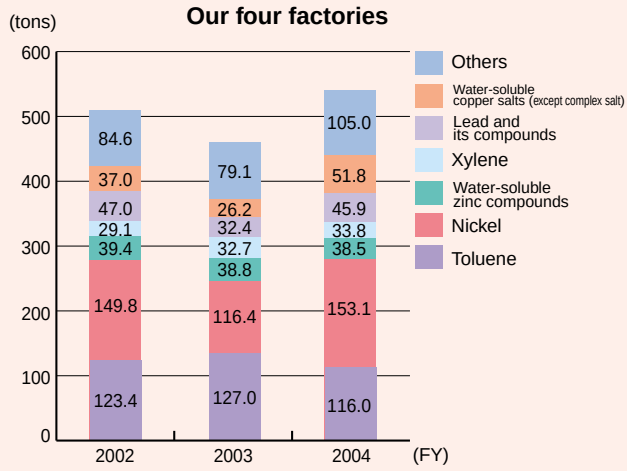
Input/output diagram of substances subject to PRTR Law

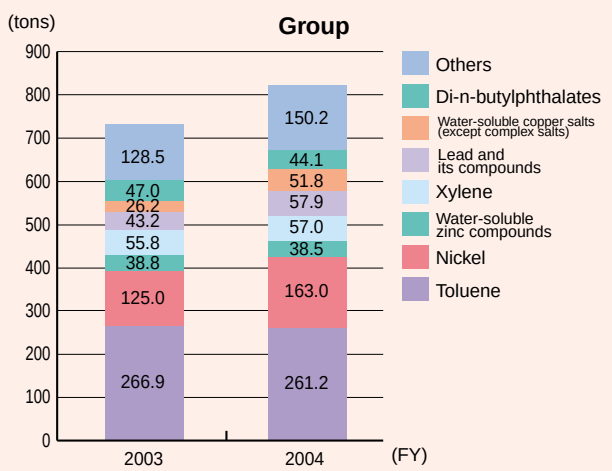


Main activities to reduce the use of hazardous substances

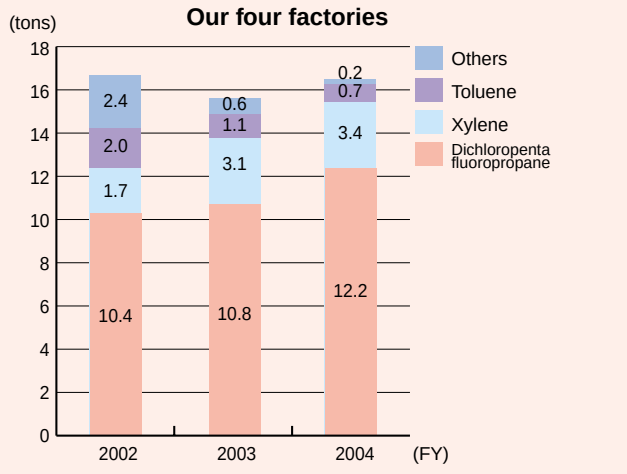
Hazardous substances	Description of activities	
Chlorinated organic solvent	Our four factories	: Abolished use in March 2003
	Affiliates	: Abolished use in May 2004
Ozone-depleting substances	The abolishment of the use of dichloropentafluoropropane (HCFC-225) by the end of FY2005 is planned, and testing for a replacement is underway.	

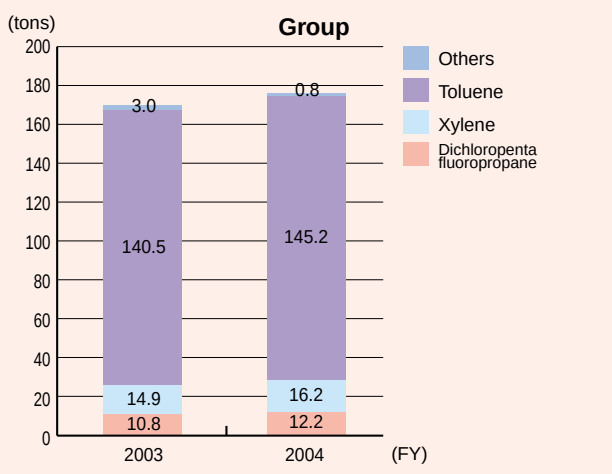
Quantity of handled substances subject to PRTR Law





Emission of substances subject to PRTR Law





Chapter 3 Products

Eco-design

In order to create a recycling-oriented society, it is important for the NGK Spark Plug Group to reduce the environmental impact of its products throughout their lifecycle. As most of the group's products are parts, their environmental effect is more difficult to see compared to that of finished products. Nevertheless, our parts are contributing to the development of products such as eco-friendly vehicles and electronic devices through the effective use of energy and resources and the purification of exhaust gas. Our main product is our spark plugs, which hold the world's largest market share of approximately 25%. While our spark plugs promote environmental conservation such as energy saving, here we also introduce the latest information about five other products.

Front-end modules



Universal A/F heated exhaust gas oxygen sensors





NHTC glow plugs



Ceramic cutting tools



Oxygen concentrators for medical use

Front-end modules

Eco-product contributing to reduction in size and weight of mobile phones

A front-end module is a component installed in mobile phones, and performs mainly the following functions:

1. **Separating the frequencies of radio waves received by an antenna;**
2. **Switching transmission and reception;**
3. **Cutting the noise of power amplifiers;**
4. **Building in a receiver bandpass filter** (working as a SAW filter).

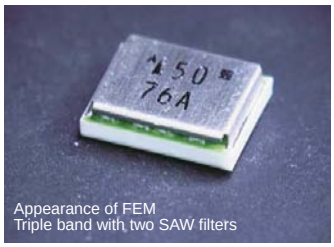
We have advanced the development of downsized front-end modules by use of our low temperature co-fired ceramic (LTCC) multilayer technology.

Conventional front-end module

The size was large because each of the parts (resistance, inductor, condenser and diode) was mounted on a printed circuit board to make up the switch.

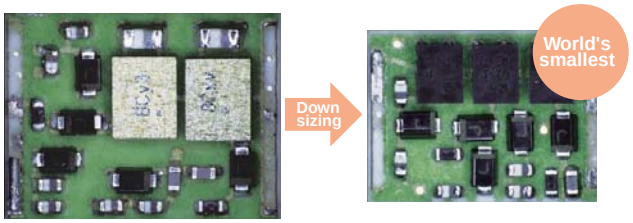
LTCC front-end module

With LTCC multilayer technology, the area is reduced to one half or one third. Low losses and high attenuation are also achieved.



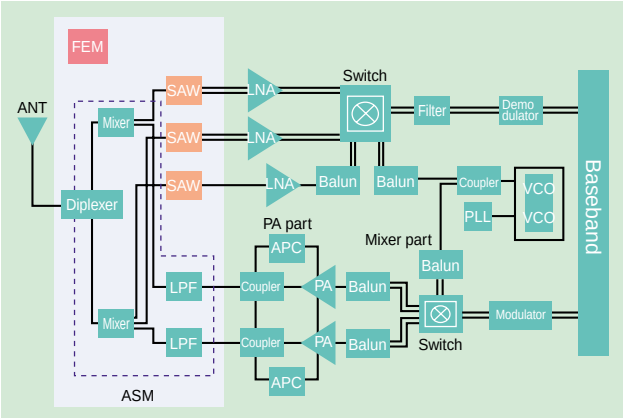
Appearance of FEM
Triple band with two SAW filters

Our newly developed front-end modules are the world's smallest (5.4 x 4.0 mm) such modules, each having a three-frequency SAW filter built in. This downsizing has resulted in more effective use of raw materials in the production process, and a reduction in use of approximately 10%. In addition, we use lead-free solder and parts to completely comply with the EU's RoHS Directive.



LTCC front-end module
Triple band with
two SAW filters 6.5 x 5.0 mm

LTCC front-end module
Triple band with
three SAW filters5.4 x 4.0 mm



NHTC glow plugs

Eco-product to reduce exhaust gas from diesel-powered vehicles

Diesel-powered vehicles use glow plugs as parts to assist engine start-up. We manufacture metal-type glow plugs and ceramic-type glow plugs. Mainly in Europe, the demand for diesel-powered vehicles is growing as they are clean and have a high thermal efficiency. With the recent tightening of environmental regulations, glow plugs have also attracted more attention as parts that contribute to the reduction of exhaust gas emissions and the improvement of starting ability. To meet such demand, we are advancing the development of glow plugs to comply with new technologies.

NHTC glow plugs
(New High Temperature Ceramic)

To achieve higher temperatures in heaters and also extend their lifespan, we have developed NHTC glow plugs that adopt silicon nitride fine ceramics in the heater part.

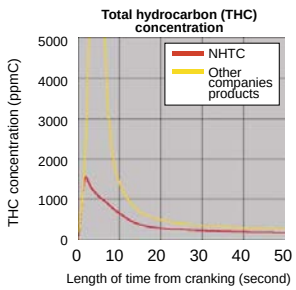


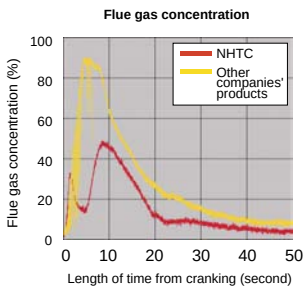
Features

1. Resources are effectively used due to the reduction in size and weight.
2. Shorter starting time improves fuel efficiency.
3. Low exhaust gas concentration and simplified treatment after the use of a catalyst mean that resources are more effectively used.
4. Maintenance is unnecessary, so no parts have to be replaced.

Example of exhaust gas reduction

We have confirmed in engine-starting tests under a low-temperature environment (-20℃) that hydrocarbon (HC) and flue gas concentration can be lowered.





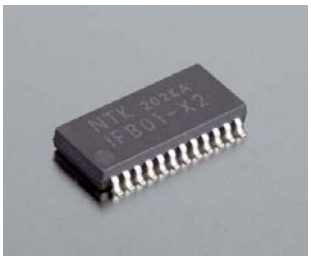
Universal A/F heated exhaust gas oxygen sensors

Eco-product working for cleaner exhaust gas

Vehicles are installed with various sensors to control the temperature, combustion and emission accurately in real time for safe and comfortable driving. Among these sensors, universal A/F heated exhaust gas oxygen sensors are for the control of emissions. A universal A/F heated exhaust gas oxygen sensor detects the air/fuel ratio in an engine based on the oxygen level and unburned gas level in the exhaust gas. The sensor measures the whole range of air/fuel ratio and communicates the result to the in-vehicle computer. This enables the precise control of the theoretical air/fuel ratio and the control of lean combustion, which contributes to the realization of cleaner exhaust gas and higher fuel efficiency. In addition to standard gasoline engines, these sensors can also be applied to gasoline direct injection engines and diesel engines.

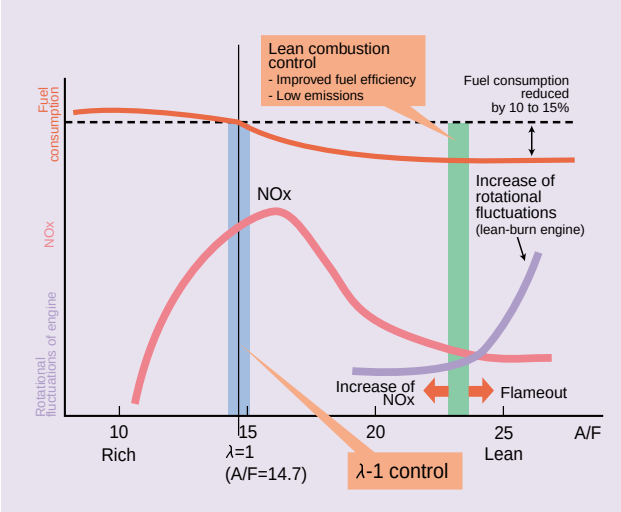


Universal A/F heated exhaust gas oxygen sensor



ASIC

This is an interface circuit between a universal A/F heated exhaust gas oxygen sensor and a computer, and outputs the air/fuel ratio signal of exhaust gas. In combination with ASIC, the universal A/F heated exhaust gas oxygen sensor can further improve performance.



What is the air/fuel (A/F) ratio?

This is the ratio of air and fuel injected into an engine. Although the theoretical A/F ratio is usually said to be 14.7:1, the actual ratio constantly fluctuates depending on the vehicle driving conditions and the environment of use of the engine.

Ceramic cutting tools

Eco-products that require no coolant

In metal cutting, the tools become more susceptible to wear because their temperature rises with frictional heat. To prevent such a rise in temperature, coolant (cooling water with a lubricating effect) is applied to the tools.
However, it has been found that the energy for using such a coolant accounts for more than half of the energy required for operating the machine tool. The result has been an increasing tendency to stop using coolant and a growing demand for more heat resistant tools. Ever since the development of the high-speed drill in 1898, many materials have been developed. Ceramic tools have mainly been used as environmentally friendly cutting tools because they have a particularly high temperature limit and allow dry cutting without a coolant.

Energy saving

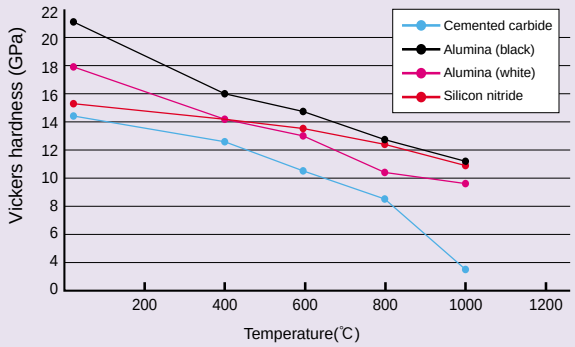
No energy required for using coolant.

Waste reduction

No waste coolant is generated.

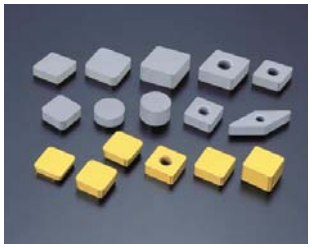


Hardness of different tool materials at high temperature





Ceramic series (alumina ceramic)



Ceramic series (silicon nitride ceramic)

Oxygen concentrators for medical use

Eco-product featuring energy saving design

This product stably generates highly concentrated oxygen and supplies it to patients of chronic respiratory diseases receiving domiciliary oxygen therapy. Of course the product needs to be reliable as a medical device, but because it is used in the home, it is also important that it does not make the patients and their family members feel uncomfortable. To this end, Nittoku has been engaged for many years in creating an energy saving design and reduction in size and weight, and in February 2005, developed this new type of oxygen concentrator featuring a further improved eco-design. This device uses our ceramic oxygen sensor.

Energy saving design

To reduce power consumption, this new product adopts a compressor with higher efficiency than existing devices. In addition, with the inverter control of the compressor, it uses minimum electricity by operating according to the flow demanded by the patient.

Reduction in size and weight

To fit in the patient's living space, we have succeeded in reducing the size by approximately 27% and weight by approximately 20% in comparison with existing products.

Low noise

The noise during operation has been reduced not to interfere with conversation or TV sound.



		New-type oxygen concentrator	Old-type oxygen concentrator
Energy saving design	Power consumption	1L/min.: 50W 2L/min.: 70W 3L/min.: 100W * Inverter control	150W/170W (50/60Hz)
Reduction in size and weight	Size	32x35x61cm	36x41x63cm
	Weight	25kg	31kg
Low noise	Operation noise in an anechoic room	29 dB (A) or less	30 dB (A) or less

Column

LCA of spark plugs

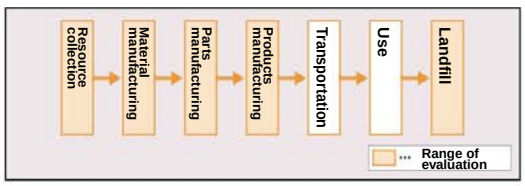
At Ecoproducts 2004 held in December of that year, we put on an exhibition of the "LCA of spark plugs" in the booth of the Japan Environmental Management Association for Industry introducing examples of the application of LCA.

Example of LCA application

NGK Spark Plug Co., Ltd.

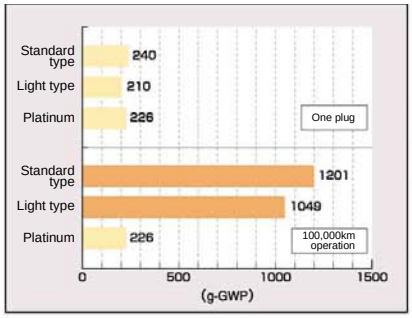
Purpose

We conducted an LCA of our leading products, NGK spark plugs (standard type and lightweight type) and NGK platinum plugs (lightweight and long-lived type), in order to measure the impact per plug on the environment and to specify any factors that make the impact more significant.



Measured influences on environment

・Consumption of resources ・Destruction of ozonosphere ・Solid waste
・Global warming ・Acidification





NGK SPARK PLUGS | NTK TECHNICAL CERAMICS
NGK SPARK PLUG CO., LTD.



Longevity of plug
Spark plug (standard and lightweight): 20,000 km
Platinum plug (long life): 100,000 km

Fuel efficiency of plugs <10-15 mode fuel efficiency>
Spark plug (standard and lightweight): 14.77 km/L
Platinum plug (long life): 15.01 km/L

Result

As a result of the analysis, we were able to find the significance and cause of the environmental load due to the five kinds of impact on the environment. The following are the influences on global warming.

① Looking at the influence on global warming per plug, CO2 conversion was 240g in standard plugs, 210g in lightweight plugs, and 226g in platinum plugs. This reveals that lightweight plugs have a 13% smaller load in comparison with the standard plugs.

② An LCA was executed in consideration of the longevity of the plug. Assuming operation for 100,000 km, for which one platinum plug is required, five spark plugs are required which makes the environmental load fivefold. This reveals that platinum plugs have the least influence on global warming when the longevity of the plug is taken into consideration.

Additional survey

Assuming that the fuel cost of the platinum plug is 2% better, we executed an LCA including use within the scope of the evaluation.
Because the use of fossil fuels has a large impact on global warming, we found that platinum plugs have a lower impact on global warming since they use less gasoline.

Contact for inquiries : Environment & Safety Management Dept., NGK Spark Plug Co., Ltd.
Contact person: Nakamura and Mizuno
Tel : +81 52-872-5980 E-mail : eco@mg.ngkntk.co.jp
Website : http://www.ngkntk.co.jp

Chapter 4 Communication

Disclosure

Publication of "ECO report"

To obtain our stakeholder's understanding of our environmental conservation activities, we have published "ECO report" since 2000 and "site reports" since 2003.
"ECO report 2004" included a description of the efforts made by 11 domestic affiliates. Five domestic affiliates are newly publishing their own site reports, bringing the total to 13 of our business locations (our four factories and nine affiliates). We will continue this voluntary information disclosure.



Circulation of ECO report 2004

Japanese version	4,000 issues
English version	2,000 issues

Accepting visitors at environmental factories

Because we want to obtain people's understanding of our environmental conservation activities, we are promoting visits at our environmental factories. In particular, we are encouraging local residents to witness our environmental measures inside and outside our business sites and answering their questions, so that they can feel more at ease in their lives. For the promotion of inter-company communications, we are also participating in Re-STEP*, which started in June 2004. By widely accepting visitors to our factories, we will revitalize environmental activities together with other local corporations.

* Mutual study system of corporate environmental activities (Chubu Bureau of Economy, Ministry of Economy, Trade and Industry)



http://restep.zttc.or.jp


Plant tour

Number of visits

Local residents, schools and local governments	10
Companies and organizations	4

Community

Environmental exhibition

To acquaint the public with our environmental conservation activities, we give presentations at environmental events.



In October 2004, we exhibited our environmentally friendly products at the Nagoya City Environmental Study Center (Ecopal Nagoya).

Cleaning activity in the local community


Head Office/Factory

Head Office/Factory
Sep. 2004 (36 people)
Nov. 2004 (26 people)
Feb. 2005 (46 people)
Mar. 2005 (40 people)

Komaki Factory
Sep. 2004 (45 people)
Mar. 2005 (45 people)

Miyanojo Factory
Jul. 2004 (105 people)
Dec. 2004 (7 people)

Ise Factory
Jul. 2004 (37 people)
Aug. 2004 (34 people)

Iijima Ceramic
May. 2004 (24 people)
Aug. 2004 (16 people)
Dec. 2004 (17 people)

Nakatsugawa Ceramic
Sep. 2004 (10 people)
Mar. 2005 (13 people)

Kani Ceramic
Jun. 2004 (16 people)
Nov. 2004 (14 people)
Feb. 2005 (22 people)

Nansei Ceramic
Jun. 2004 (14 people)
Sep. 2004 (18 people)
Dec. 2004 (14 people)
Mar. 2005 (15 people)

Kamioka Ceramic
May. 2004 (25 people)
Oct. 2004 (26 people)

Nittoku Seisakusho
Jun. 2004 (16 people)
Sep. 2004 (17 people)
Dec. 2004 (22 people)
Mar. 2005 (25 people)

Nichiwa Kiki
Sep. 2004 (20 people)
Mar. 2005 (22 people)

Ceramic Sensor
Sep. 2004 (11 people)

Tono Ceramic
May. 2004 (8 people)
Jun. 2004 (23 people)
Jul. 2004 (11 people)
Oct. 2004 (20 people)
Jan. 2005 (13 people)
Feb. 2005 (13 people)


Ise Factory

Natural environment

Greening of factories

Miyanojo Factory stands on a site surrounded by greenery, and there are also natural forests and grounds within its site. The factory is continuously involved in efforts to care for this rich nature, including weeding, pruning and planting, and in 2003 it won the Director of Kyushu Bureau of Economy's Excellent Greening Factory Award.


Entrance of Miyanojo Factory

Chapter 5 Mind-set

Education and enlightenment

Safety/health and environmental convention

We have organized an environmental convention every year since 2001 for the purpose of making our all employees deeply aware of our environmental activities and challenges. In the fourth convention held in FY2004, we added the new theme of “occupational safety and health” and changed the title to “Safety/health and environmental convention”. To enable the attendance of as many employees as possible, in addition to the main convention primarily composed of lectures, we also organized sessions in different factories and affiliates featuring examples of improvement as the central theme.
Other events involving all employees included an anonymous questionnaire survey to identify their experiences of safety, health and environmental risks. This enabled us to see the real picture that is often hidden, such as the level of our employee’s awareness of such risks, and whether they had had experiences where an accident almost occurred.


Main convention


Site convention(Head Office)

Encouraging the acquisition of official qualifications

To ensure the compliance with environmental conservation-related laws, regulations and agreements, and with voluntary standards under the company’s environment policy, we develop, train and nurture employees to gain expertise and official qualifications according to the needs identified for each operation site.

Numbers of officially qualified employees

		Our four factories	Affiliates
Pollution control manager	Air	31(6)	2(0)
	Water	54(6)	13(2)
	Noise	39(6)	2(0)
	Vibration	25(6)	2(0)
Energy manager	Heat	17(2)	1(0)
	Electricity	18(4)	9(3)
Specially controlled industrial waste manager		25(3)	13(9)
Environment measurement engineer		1(0)	0(0)
Work environment measurement engineer		11(0)	2(0)

* Total number of persons. Figures in parentheses indicate the number required by law.

Environment card

We distribute an environment card to every of our employee so that they understand and are aware of our environment policy. The employees write the “organization’s objectives and goals” and “my individual efforts” on the environment cards to be more aware of environmental conservation in their everyday activities.



Proposals for improvement

We have a proposal system in which employees can make a proposal for innovation and improvement in processes and operations. In FY2004, there were 36,944 proposals, many of which were ideas on environmental issues such as energy saving and waste reduction. Every employee is contributing to environmental conservation through the steady improvement of his or her daily jobs.

Safety/health and environmental news

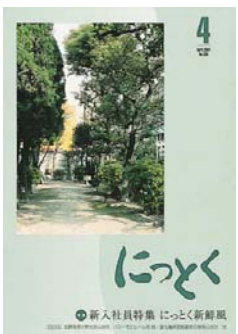
To educate and enlighten our employees, we issue “Nittoku Environmental News” periodically to provide information on our ISO14001-based activities and environment preservation activities and challenges as well as various related events. In FY2004, we changed the title to “Health, Safety and Environmental News” in which we began to issue news on smoking risks and safety signs.





Employee magazine "Nittoku"

We have pages dedicated to the environment in our monthly employee magazine “Nittoku”. The magazine deals with environment-related events and topics both in Japan and overseas, and the impact of environment-related regulations on our activities, etc., in order to help raise our employee’s environmental awareness.





Chapter 6 Data section

PRTR

(kg)

	Ordinance No.	Substance name (substance to be reported)	Quantity handled	Release quantity			Volume of material transferred		Recycled mass	Removal/ disposal quantity	Discharged mass
				Air	Public water area	Soil	Public sewerage	Waste			
Head Office/Factory	1	Water-soluble zinc compounds	7,140				527		1,485		5,128
	40	Ethyl benzene	1,211							1,211	
	63	Xylene	13,835	17				0		13,818	
	68	Chromium and trivalent chromium compounds	3,082				139	0	458		2,486
	108	Inorganic cyanogens compounds (except complex salts and cyanate)	1,115				12			1,103	
	144	HCFC-225ca	3,125	3,125							
	227	Toluene	104,245	285						103,960	
	231	Nickel	37,023						224		36,798
	299	Benzene (for fuel)	4,882	13						4,870	
Komaki Factory	1	Water-soluble zinc compounds	5,331		10				103		5,218
	25	Antimony and its compounds	2,027					2	408		1,617
	30	Condensation polymer of 4.4'-isopropylidendiphenyl and 1-chroro-2.3-epoxypropane (also called bisphenol A epoxy resin) (liquid form only)	5,548						269		5,279
	40	Ethyl benzene	2,376	106					523	1,746	
	63	Xylene	17,555	1,628				2,279	4,511	9,136	
	68	Chromium and trivalent chromium compounds	1,449					127	453		868
	85	HCFC-22	1,027						1,027		
	100	Cobalt and its compounds	2,980					8	231		2,741
	108	Inorganic cyanogens compounds (except complex salts and cyanate)	7,731						92	2,508	5,130
	144	HCFC-225ca	2,034	2,034							
	207	Water-soluble copper salts (except complex salts)	51,799		19			1	960		50,819
	227	Toluene	11,754	435					27	11,291	
	230	Lead and its compounds	3,074	1				98	372		2,603
	231	Nickel	1,408	0				4	110		1,293
	232	Nickel compounds	11,952		18			5	3,124	0	8,807
	299	Benzene (for fuel)	1,115	4						1,110	
	304	Boron and its compounds	12,577		2			56	1,525	1	10,992
	309	Poly (oxyethylene) nonylphenolether	1,888		1				1,868	19	
	310	Formaldehyde	5,845						5,787	58	
	311	Manganese and its compounds	5,794		18			149	5,596		31
	346	Molybdenum and its compounds	1,771	1				12	123		1,635
Miyanojo Factory	1	Water-soluble zinc compounds	26,001						3,768		22,233
	68	Chromium and trivalent chromium compounds	1,631					0	1,551		80
	108	Inorganic cyanogens compounds (except complex salts and cyanate)	2,622						52	2,570	
	144	HCFC-225ca	7,000	7,000							
	231	Nickel	114,707								114,707
	304	Boron and its compounds	3,017						106		2,909
Ise Factory	30	Condensation polymer of 4.4'-isopropylidendiphenyl and 1-chroro-2.3-epoxypropane (also called bisphenol A epoxy resin) (liquid form only)	2,270						2,042		227
	43	Ethylene glycol	1,632						1,632		
	63	Xylene	2,447	1,775					673		
	230	Lead and its compounds	42,836						10,858		31,971
	243	Barium and its water-soluble compounds	3,672						996		2,676
	310	Formaldehyde	1,980						1,980		
	311	Manganese and its compounds	1,602						1,378	0	223
Iijima Ceramic	63	Xylene	11,085	8,205					2,880		
	68	Chromium and trivalent chromium compounds	2,117					1,430			687
	108	Inorganic cyanogens compounds (except complex salts and cyanate)	9,192		1				3,054	4,805	1,331
	230	Lead and its compounds	5,945						631		5,314
	231	Nickel	2,158								2,158
	232	Nickel compounds	1,097						1,097		
	270	Di-n-buthylphthalates	9,011					4,180	1,426	3,405	
	346	Molybdenum and its compounds	4,189					1,593			2,596
Nakatsugawa Ceramic	63	Xylene	12,064	4,533					7,489		42
	64	Silver	1,585								1,585
	68	Chromic oxide compounds	9,419					3,010	32		6,377
	227	Toluene	145,161	144,523					638		
	230	Lead and its compounds	3,695						1,686		2,009
	270	Di-n-buthylphthalates(DBP)	30,975					6,878	5,834	7,807	10,456
	346	Molybdenum and its compounds	3,488					617	495		2,376
Kani Ceramic	270	Di-n-buthylphthalates	4,081					1,973	426		1,683
Nansei Ceramic	230	Plumbous	2,370						2,368		2
Nittoku Seisakusho	231	Nickel	7,665								7,665
Ceramic Sensor	253	Hydrazine	8,962						7,621	1,341	
	283	Hydrogenfluoride and its water-soluble compounds	2,450		194			0	2,256	0	
	304	Boron and its compounds	1,746		446						1,297

Waste

	Volume of emissions (tons)	Volume effectively used (tons)	Volume of landfill and incineration (tons)	Recovery rate (%)
Head Office/Factory	901.0	894.6	6.4	99.3
Komaki Factory	11,619.9	11,563.3	56.6	99.5
Miyanojo Factory	3,056.8	3,038.0	18.8	99.4
Ise Factory	1,552.0	1,544.9	7.1	99.5
Iijima Ceramic	1,144.5	1,002.1	142.4	87.6
Nakatsugawa Ceramic	340.5	118.9	221.6	34.9
Kani Ceramic	114.9	54.0	60.8	47.0
Nansei Ceramic	47.5	47.0	0.5	98.9
Kamioka Ceramic	94.4	92.2	2.2	97.6
Nittoku Seisakusho	220.8	219.2	1.5	99.3
Nitiwa Kiki	6.6	5.9	0.7	89.5
Tono Ceramic	14.7	8.4	6.3	57.4
Ceramic Sensor	785.3	775.6	9.7	98.8
Total	19,898.9	19,364.3	534.6	1,108.7

Air, water and noise

	Item	Type		Unit	Statutory regulation value	Voluntary regulation value	Average	MAX
Head Office/ Factory	Atmosphere	Dust	Boiler (No. 12)	mg/Nm³	50	40	< 2	< 2
			Furnace (PR-2)	mg/Nm³	150	120	6	6
		NOx	Boiler (No. 12	ppm	150	120	58	58
			Furnace (PR-2)	ppm	180	144	29	30
	Drain (drainage)	pH		-	5.0~9.0	5.7~8.6	7.1	7.4
		SS		mg/L	600	480	19	46
		BOD		mg/L	600	480	14	75
		n-Hexane extract		mg/L	30	24	4.4	12
		Cyan		mg/L	1	0.8	0.16	0.20
		Total chromium		mg/L	2	1.6	0.04	0.11
		Hexavalent chromium		mg/L	0.5	0.4	< 0.04	< 0.04
		Zinc		mg/L	5	4	1.4	2.9
		Lead		mg/L	0.1	0.08	< 0.02	< 0.02
		Nitrogen		mg/L	120	96	16	22
		Phosphorus		mg/L	16	12.8	0.39	0.66
		Fluorine		mg/L	8	6.4	0.08	0.3
		Boron		mg/L	10	8	< 1	< 1
	Noise	Morning	R spot	dB	70	68	61.0	61.0
			T spot	dB	65	63	*1 65.3	*1 65.3
		Daytime	R spot	dB	70	68	60.9	60.9
			T spot	dB	65	63	*1 67.7	*1 67.7
		Evening	R spot	dB	70	68	60.1	60.1
			T spot	dB	65	63	*1 68.2	*1 68.2
		Night	R spot	dB	65	64	51.8	51.8
			T spot	dB	55	54	*1 68.7	*1 68.7
Komaki Factory	Atmosphere	Dust	Boiler (No. 1 - 5)	mg/Nm³	200	160	< 2	< 2
			Furnace (No. 9 - 10)	mg/Nm³	200	160	6	9
		NOx	Boiler (No. 1 - 5)	ppm	250	200	28	34
			Furnace (No. 9 - 10)	ppm	200	160	125	170
	Integrated drain (public water area)	pH		-	6.0~8.0	6.2~7.8	7.3	7.6
		SS		mg/L	30	24	3.1	6.0
		BOD		mg/L	25	20	4.6	9.4
		COD		mg/L	25	-	3.7	5.6
		n-Hexane extract		mg/L	5	4	0.04	0.50
		Cyan		mg/L	0.5	0.4	0.008	0.100
		Total chromium		mg/L	1	0.8	< 0.04	< 0.04
		Hexavalent chromium		mg/L	0.2	0.16	< 0.04	< 0.04
		Copper		mg/L	1	0.8	0.02	0.05
		Zinc		mg/L	3	2.4	0.12	0.28
		Lead		mg/L	0.1	0.08	0.006	0.04
		Nitrogen		mg/L	120	60	6.3	8.9
		Phosphorus		mg/L	16	4	0.36	0.57
		Nickel		mg/L	-	-	0.17	0.30
		Manganese		mg/L	-	-	0.04	0.20
		Boron		mg/L	8	6.4	0.5	0.7
		Fluorine		mg/L	10	8	0.25	2.0
	Noise	Morning	Fifth spot	dB	65	63	60.4	60.4
		Daytime	Fifth spot	dB	70	68	63.0	63.0
		Evening	Fifth spot	dB	65	63	63.7	63.7
		Night	Fifth spot	dB	60	58	*1 60.6	*1 60.6
Miyanojo Factory	Atmosphere	Dust	Cooling and heating machine	mg/Nm³	300	240	7	7
			Generating machine (No. 2)	mg/Nm³	100	80	8	8
		NOx	Cooling and heating machine	ppm	180	144	73	73
			Generating machine (No. 2)	ppm	950	900	705	740
		SOx	Generating machine (No. 2)	Nm³/h	3.9	3.0	0.14	0.16
	Drain (public water area)	pH		-	6.0~8.0	6.5~7.8	7.5	7.7
		SS		mg/L	35	28	4.8	9
		BOD		mg/L	20	16	2.6	8
		COD		mg/L	160	128	15	16
		n-Hexane extract		mg/L	5	4	< 2.5	< 2.5
		Cyan		mg/L	1	0.8	< 0.05	< 0.05
		Hexavalent chromium		mg/L	0.5	0.4	< 0.05	< 0.05
		Copper		mg/L	3	2.4	< 0.05	< 0.05
		Zinc		mg/L	3	2.4	< 0.05	0.07
		Lead		mg/L	0.1	0.08	< 0.01	< 0.01
		Fluorine		mg/L	8	6.4	< 0.2	< 0.2
		Boron		mg/L	10	8	1.4	2.8
		E. coli		counts/cm³	3000	2400	0	0
	Noise	Morning		dB	60	55	47.0	52.0
		Daytime		dB	65	60	48.8	52.0
		Evening		dB	60	55	48.3	49.0
		Night		dB	50	50	47.3	49.0
Ise Factory	Atmosphere	Dust	Furnace	mg/Nm³	250	100	< 5	< 5
		NOx	Furnace	ppm	180	140	36	48
	Drain (public water area)	pH		-	5.8~8.6	6.0~8.4	7.3	7.5
		SS		mg/L	90	24	1.1	2.0
		BOD		mg/L	25	8	1.7	9.0
		COD		mg/L	25	12	1.2	2.0
		n-Hexane extract		mg/L	5	2.5	< 1	< 1
		Cyan		mg/L	1	0.5	< 0.1	< 0.1
		Total chromium		mg/L	2	1	< 0.04	< 0.04
		Hexavalent chromium		mg/L	0.5	0.25	< 0.04	< 0.04
		Copper		mg/L	1	0.5	< 0.02	< 0.02
		Zinc		mg/L	5	2.5	< 0.005	< 0.005
		Lead		mg/L	0.1	0.05	0.007	0.010
		Nitrogen		mg/L	120	60	2.3	12
		Phosphorus		mg/L	16	8	2.4	6.3
		Manganese		mg/L	-	-	< 0.02	< 0.02
		Fluorine		mg/L	8	4	< 0.1	< 0.1
		Boron		mg/L	10	5	0.52	0.98
		E. coli		counts/cm³	3000	1500	0	0
	Noise	Morning		dB	55	55	49.8	49.8
		Daytime		dB	60	58	51.3	51.3
		Evening		dB	55	55	49.8	49.8
		Night		dB	50	50	49.5	49.5

*1 Due to background noise. Background noise means the noise when machines and other equipment are not in operation, and so refers to outside traffic, neighboring factories, and so on.
*2 For the violation code, see p.15 “Compliance”.

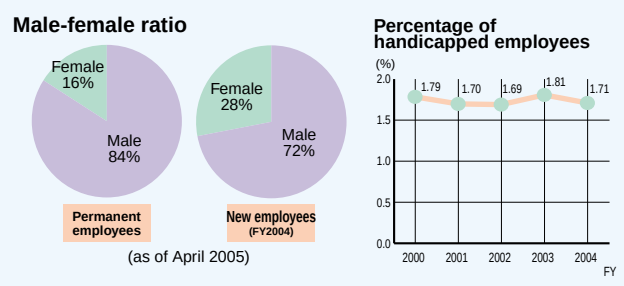
	Item	Type		Unit	Statutory regulation value	Voluntary regulation value	Average	MAX
Iijima Ceramic	Atmosphere	Dust	Steam boiler (No. 1)	mg/Nm³	100	100	5	5
			Cooling and heating machine	mg/Nm³	100	100	5	5
		NOx	Steam boiler (No. 1)	ppm	150	150	59	59
			Cooling and heating machine	ppm	150	150	30	30
	Drain (drainage)	pH		-	5.8~8.6	6.0~8.0	7.3	7.4
		SS		mg/L	50	10	2.7	4.0
		BOD		mg/L	30	25	3.7	7.3
		n-Hexane extract		mg/L	5	5	< 1	< 1
		Cyan		mg/L	0.5	0.3	< 0.01	< 0.01
		Total chromium		mg/L	1	1	< 0.02	< 0.02
		Hexavalent chromium		mg/L	0.3	0.3	< 0.02	< 0.02
		Copper		mg/L	2	2	0.025	0.04
		Zinc		mg/L	3	3	0.055	0.07
		Lead		mg/L	0.1	0.1	0.006	0.008
		Phosphorus		mg/L	16	16	1.2	1.5
		E. coli		counts/cm³	3000	3000	3	10
	Noise	Morning	First spot	dB	-	65	50.0	50.0
		Daytime	First spot	dB	-	65	61.0	61.0
		Evening	First spot	dB	-	65	50.0	50.0
		Night	First spot	dB	-	55	48.0	48.0
Nakatsugawa Ceramic	Atmosphere	Dust	Furnace (NN-1)	mg/Nm³	50	40	6	12
		NOx	Furnace (NN-1)	ppm	-	-	120	120
	Drain (public water area)	pH		-	5.8~8.6	6.2~8.2	7.6	8.2
		SS		mg/L	50	35	4.4	20
		BOD		mg/L	15	13	5.7	7.5
		COD		mg/L	40	30	6.1	8.7
		n-Hexane extract		mg/L	5	4	0.5	0.5
		Nitrogen		mg/L	10	10	4.9	7.1
		Phosphorus		mg/L	3	2.5	0.35	0.55
		E. coli		counts/cm³	3000	1000	45	150
	Noise	Morning		dB	60	58	52.5	53.0
		Daytime		dB	65	63	52.5	53.0
		Evening		dB	60	58	53.5	54.0
		Night		dB	50	50	50.0	50.0
Kani Ceramic	Atmosphere	Dust	Boiler	mg/Nm³	100	90	6	6
		NOx	Boiler	ppm	150	135	96	96
	Drain (public water area)	pH		-	5.8~8.6	5.9~8.5	6.8	6.8
		SS		mg/L	200	180	4.4	4.4
		BOD		mg/L	160	144	30	30
		COD		mg/L	160	30	11	11
		n-Hexane extract		mg/L	5	4.5	1	1
	Noise	Morning	First spot	dB	50	50	*2 52.1	*2 55.1
		Daytime	First spot	dB	60	60	51.4	53.1
		Evening	First spot	dB	50	50	*2 51.5	*2 54.6
		Night	First spot	dB	45	45	*2 50.2	*2 51.9
Nansei Ceramic	Integrated drain (public water area)	pH		-	5.8~8.6	5.8~8.6	7.4	7.7
		SS		mg/L	200	90	4	7
		BOD		mg/L	20	20	3.7	7
		COD		mg/L	160	40	8.7	17
		n-Hexane extract		mg/L	5	5	<1	<1
		Lead		mg/L	0.1	0.1	0.01	0.02
		Nitrogen		mg/L	120	100	10.6	19
		Phosphorus		mg/L	16	16	1.8	3.7
		E. coli		counts/cm³	3000	1000	40	120
	Noise	Morning	North	dB	55	55	54.5	54.5
		Daytime	North	dB	60	60	58.3	58.3
		Evening	North	dB	55	55	53.1	53.1
		Night	North	dB	50	50	49.5	49.5
Kamioka Ceramic	Drain (public water area)	pH		-	5.8~8.6	6.2~8.2	7.7	7.8
		SS		mg/L	200	50	2.9	3.8
		BOD		mg/L	160	40	6.2	11
		COD		mg/L	160	40	7.7	12
		n-Hexane extract		mg/L	5	2.5	<0.5	<0.5
	Noise	Morning	Fourth spot	dB	60	60	50.0	52.0
		Daytime	Fourth spot	dB	65	65	53.7	54.0
		Evening	Fourth spot	dB	60	60	53.7	54.0
		Night	Fourth spot	dB	50	50	*2 51.1	*2 54.0
Nittoku Seisakusho (Head Office/Factory)	Drain (public water area)	pH		-	5.0 or more	5.8~9.0	7.1	7.3
		SS		mg/L	600	300	12	18
		BOD		mg/L	600	300	49	49
		n-Hexane extract		mg/L	50	25	0.6	0.6
	Noise	Morning		dB	60	60	58.6	58.6
		Daytime		dB	65	65	59.5	59.5
		Evening		dB	60	60	57.0	57.0
Nittoku Seisakusho (Oguchi Factory)	Drain (public water area)	pH		-	5.8~8.6	6.0~8.4	7.3	7.6
		SS		mg/L	30	30	2.7	6
		BOD		mg/L	25	20	1.4	3.3
		n-Hexane extractNitrogen		mg/L	5	4	1	1
		Nitrogen		mg/L	120	60	0.6	0.6
		Phosphorus		mg/L	16	8	0.01	0.01
	Noise	Morning		dB	55	55	48.3	53.0
		Daytime		dB	60	60	54.0	58.0
		Evening		dB	55	55	50.3	54.0
		Night		dB	50	50	45.7	47.0
Nichiwa Kiki	Drain (drainage)	pH		-	5 or more	6~8	6.9	6.9
		n-Hexane extract		mg/L	50	20	2	2
	Noise	Daytime		dB	65	63	59.4	62.6
Tono Ceramic	Atmosphere	Dust	Furnace	mg/Nm³	200	200	22	22
		NOx	Furnace	ppm	400	400	42	42
	Drain (public water area)	pH		-	-	5.8~8.6	8.0	8.0
		SS		mg/L	-	200	160	160
		BOD		mg/L	-	160	140	140
		n-Hexane extract		mg/L	-	5	0.5	0.5
	Noise	Morning		dB	50	50	49.0	49.0
		Daytime		dB	60	60	58.0	59.0
		Evening		dB	50	50	49.0	49.0
		Night		dB	45	45	44.0	44.0
Ceramic Sensor	Atmosphere	Dust	Boiler	mg/Nm³	100	100	8	10
		NOx	Boiler	ppm	150	150	81	88
	Drain (public water area)	pH		-	6.0~8.0	6.0~8.0	7.1	7.3
		SS		mg/L	18	14.4	4.8	10
		BOD		mg/L	18	14.4	5.8	17
		COD		mg/L	18	14.4	13.6	*2 30
		n-Hexane extract		mg/L	2	1.6	1.0	1.0
		Nitrogen		mg/L	30	24	15	17
		Phosphorus		mg/L	4	3.2	1.0	3.0
		Fluorine		mg/L	8	8	4.1	*2 11
		Boron		mg/L	10	10	2.0	2.8
	Noise	Daytime		dB	70	70	60.2	61.8
		Night		dB	60	60	58.5	59.7

Here we report on the social aspects of the activities of our NGK Spark Plug factories.

Employment and personnel management system

Equal opportunities

We are working to eliminate discrimination by race, sex, belief, handicap, etc. from our recruiting process and workplaces to ensure equality of opportunities. We have increased the choices for motivated employees by establishing a job switching system and installed security equipment to expand the job categories for women and arrange a system where they can work midnight shifts.

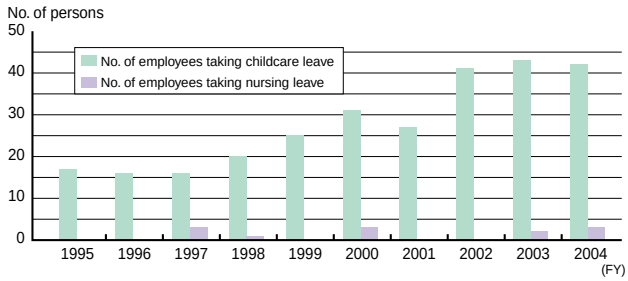


Supporting simultaneous pursuits

We are striving to establish a work environment that allows the simultaneous pursuit of job and childcare or job and nursing care.

Schemes to support childcare

Childcare leave scheme	To the age of 1 year
Childcare leave extension scheme	To the age of 2 years (e.g. when no nursery school is available)
Special leave scheme	5 days a year until entrance into elementary school; with no payment (for nursing the child)
Short-time work scheme	To the age of 1 year; to take half an hour for childcare twice a day



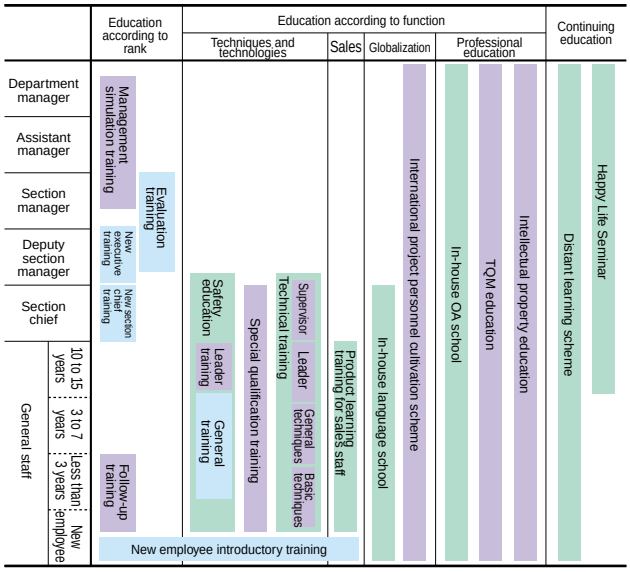
Ms. Kiyomi Ikeo,
Quality Control Office, Semiconductor Parts Dept.

I have used the childcare leave scheme twice. During each period of leave, I performed childcare and housekeeping with the cooperation of my family, and then returned to the office one year later. Although I felt anxious about returning, I have enjoyed office life while talking about concerns with my kids and just chatting with my colleagues, which releases some stress. It is tough to pursue work, childcare and housekeeping at the same time. Nevertheless, two years after my return, I can now relax thanks to the cooperation of my family and colleagues. I hope more people use the scheme to live a fuller life.



Support to capacity development

Even with the advance of office automation and increased production by use of automatic equipment and robots, the backbone of a company is its employees. We provide education for employees to obtain knowledge and techniques, starting with new employee training, according to the ranks and functions of employees and in consideration of the job description and business environment. We also offer continuing education.



After mandatory retirement

Re-employment system for ex-employees who retired at retirement age

In view of the possible upward revision of Japan's welfare pension system's qualifying age, there is a growing demand to provide employment opportunities after mandatory retirement. We introduced a system of re-employing ex-employees who retired because they had reached retirement age after April 2001, in order to effectively utilize the knowledge, skills and experience cultivated by employees during their careers.

Happy Life Seminar

Since 1994 we have held Happy Life Seminars (overnight stay, with spouses) for employees who have reached 50 years old. Through lectures and group discussions, this seminar gives them opportunities to think about their sense of purpose in their second life as well as their health and finances.

No. of persons

	FY2004	Total
Re-employed ex-employees	28	137
Participants in the Happy Life Seminar*	65	880

*Excluding spouses

Management of work hours

To ensure proper management of work hours and prevention of excessive work and unpaid overtime, we introduced a work hour management system using IC cards in October 2004. We are also developing enlightenment activities to make employees suitably aware of work hours by distributing our "Work Hour Management Handbook" to all employees.

Occupational safety and health

Occupational safety and health policies

In April 2005, we formulated our philosophy and policy on occupational safety and health in order to promote the establishment of an occupational safety and health management system.

Philosophy

Based on respect for human dignity, we position occupational safety and health as the starting point of our corporate activities.

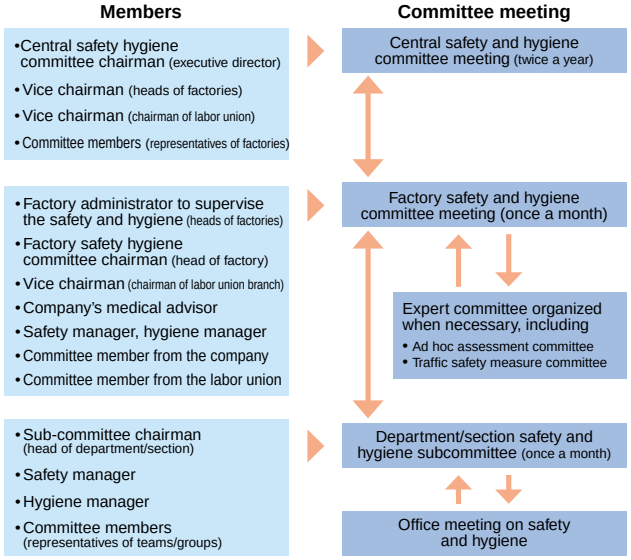
Occupational safety and health policy

- We will comply with the law and our voluntary standards related to occupational safety and health.
- We will reduce risks and eliminate occupational accidents through the continual improvement of our occupational safety and health system and performance.
- We will acquaint all employees with this policy, encourage self-awareness through education and enlightenment, and broadly develop occupational safety and health activities across the organization.

Slogan

Reduce risks and build a physically and mentally healthy work environment!

Safety and hygiene management organization



Occupational safety and health management system

We have implemented risk assessment since April 2004 in an effort to obtain certification for its occupational safety and health management system by autumn 2006. Risk assessment identifies risk sources and quantitatively evaluates risks based on the degree of injury, size of hazard and frequency of approaching the risk sources. By taking countermeasures against each high risk source in turn, we will advance the establishment of this management system.

Changes in disabling injury frequency rate

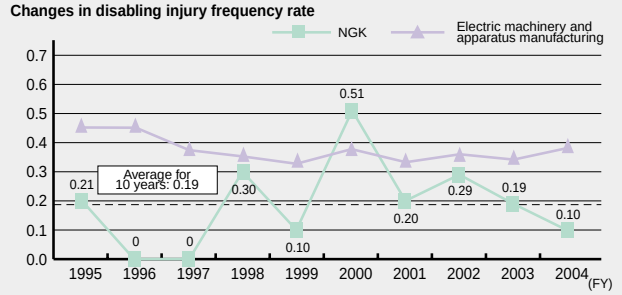
Our disabling injury frequency rate in FY2004 was 0.10, with only one disabling accident. When a disabling accident occurs, we try to prevent a recurrence by setting up a special task force composed of safety and health committee members to assess the countermeasures at the workplace where the accident occurred and the adequacy of the management system.
A questionnaire survey on risks conducted in FY2004 as part of a health, safety and environmental convention revealed that many risks such as unsafe actions and conditions are lurking in our immediate surroundings. In response to the results, we are encouraging the improvement of problems at each workplace to prevent accidents.

$$\text{Disabling injury frequency rate} = \frac{\text{No. of disabling accidents} \times 1\text{ million}}{\text{total work hours}}$$

No. of disabling accidents — No. of accidents

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
2	0	0	3	1	5	2	3	2	1

Changes in disabling injury frequency rate



Awards for workplaces with no accidents

We award workplaces that have had no accidents for a certain period of time. Different criteria are applied to the period of time depending on the job content and the opportunities for contact with danger. For example, the period is set at 18 months for the manufacturing sector but 36 months for the clerical sector. In workplaces that win this award, all employees are given a commemorative gift to celebrate the achievement and to encourage them to continue their efforts to avoid accidents.

Earthquake disaster prevention committee

We have established an Earthquake Disaster Prevention Committee to prepare us for a large-scale earthquake based on sound precautions and a risk management system that can protect employees. We also organize various activities to prevent disaster and minimize damage including the improvement of buildings and evacuation drills.

Mental health

The increasingly complicated social life of recent years is accompanied by various kinds of stress and problems in personal relationships, which can lead to mental illness in more than a few cases. Since FY2001, we have been making efforts to provide thorough mental health care, which can be accessed outside the company in order to ensure the protection of privacy.

Separation of smoking areas

Smoking has an impact on the health of the smoker, and secondhand smoke can also affect the health of the people around the smoker. We are working to maintain non-smoker's health by prohibiting smoking in dining rooms and separating smoking areas from rest areas to prevent secondhand smoking.



Social and local activities

Expo 2005 Aichi, Japan

We support the 2005 World Exposition in Aichi, Japan (Expo 2005), which has been held since March 25, 2005.

Activities in Expo 2005

In the Expo 2005 Aichi in Japan, where one of the sub-themes is “Development for Eco-communities,” the EPOC and the Japan Association for the 2005 World Exposition jointly organize backyard tours to observe environmental technologies hidden behind the pavilions and facilities. We dispatch staff as a member company of the EPOC, and introduce cutting-edge environmental technologies to visitors. We also publish business advertisements on a giant Ferris wheel in the Nagakute Area to encourage environmental consideration.



*** EPOC: Environmental Partnership Organizing Club**
http://www.epoc.gr.jp

Cleaning activities organized by local governments

As companies are also citizens that make up society, we participate in cleaning and landscaping activities organized by local governments in order to support the creation of a comfortable environment.

Participation in FY2004

Apr. 2004	Mt. Komaki landscaping activity (Organized by Council for Promotion of Prevention of Garbage Littering in Komaki City)	11 persons
Jun. 2004	Clean Campaign Nagoya 2004 (Organized by Nagoya City and Nagoya Urban Landscaping League; participated as member company of EPOC)	1 persons
Oct. 2004	Cleaning activity in Komaki City	9 persons
Nov. 2004	Secure, Safe and Comfortable Urban Development Campaign, Nagoya 2004 (Organized by Nagoya City and Nagoya Urban Landscaping League; participated as member company of EPOC)	3 persons


Mt. Komaki landscaping activity

Morimura Okura Museum(an Expo 2005 Aichi, Japan partnership project)

On March 5, 2005, the four companies of Morimura Group (Noritake Co., Limited, Toto Ltd., NGK Insulators Ltd. and NGK Spark Plug) opened their jointly established Morimura Okura Museum, “CANVAS”. It introduces the history of ceramics, the use of ceramics in daily life and industry, their contribution to the global environment, and so on, and also conveys the fascinating aspects of design and manufacturing.



Traffic safety

In the hope of improving traffic safety in the areas around our factories, we perform street patrols and other activities.

Komaki Factory

All local governments in Aichi Prefecture take part in prefectural traffic safety campaigns four times a year (spring, summer, autumn and year-end). As part of the campaigns, street patrols are carried out across the prefecture, in which approximately 20 executives and other employees of Komaki Factory participate every time. In the morning rush hour, street patrols are conducted at crossings near the factory for about an hour to encourage traffic safety.



Miyanojo Factory

Miyanojo Factory, with its many automobile commuters, encourages driving with headlights switched on throughout the day. Driving with headlights on even during the daytime helps let other road users know you are there, and can prevent accidents due to the negligence of oncoming traffic.

Local cultural activities

Participation in festivals

Since Miyanojo Factory started operating in 1974, it has participated in the Hometown of Bamboo Miyanojo Summer Festival. In 2004, 103 employees participated in the Miyanojo Ondo dance to the sound of Itsutsu Daiko, a traditional performing art.



Opening of a playing field for the community

When requested by the local community, Miyanojo Factory opens its playing field for events such as official rugby games, training camps and children’s baseball.



Consumers

Personal Information Protection Law

In April 2005, the Personal Information Protection Law was fully enforced. This law obligates companies to properly handle personal information through, for example, the identification of the purpose of use. We have also notified all employees of the specific activities for the protection of personal information by publishing our “Guidelines on Handling Personal Information” in April 2005. For customers using our website, we describe our personal information protection policy on-line.



“Personal information protection policy” on our website

Disclosure of information on products

We introduce information on products through our catalogs and websites.



Automobile products



Communication products



Ceramic products



NGK spark plugs Plug Studio

There are many part numbers on spark plugs, and the type and required number of spark plugs differs depending on the model of the car in which the plug is used. The Plug Studio is mainly for customers who want to replace plugs by themselves, allowing them to search for suitable plugs. Along with information on products such as spark plugs and power cables, we also provide information on events and races.

http://www.ngk-sparkplugs.jp

Exhibition at trade shows

To publicize the products and our latest technologies to as many customers as possible, we are making presentations at various trade shows and events. In FY2004, we exhibited spark plugs, glow plugs, various types of sensors and cutting tools at the following trade shows, where we received many visitors.

Major events where we gave presentations in FY2004

May 19-21	Automotive Engineering Exposition 2004
Nov. 2- 7	The 38th Tokyo Motor Show 2004
Nov. 10-12	MWE 2004
Jan. 14-16	Tokyo Auto Salon 2005 with NAPAC
Feb. 11-13	Osaka Automesse 2005
Feb. 18-20	Fukuoka Auto Salon 2005
Mar. 19-21	Osaka Motorcycle Show 2005



The 38th
Tokyo Motor Show



Automotive Engineering
Exposition 2004

Messages from stakeholders



Ms. Yuka Tamura

Full-time lecturer in Environmental & Social Studies, Faculty of Humanities, Kyoto Seika University

In this year's report, I especially focused on the list of "NGK Spark Plug Group Eco Vision 2010." The activities and progress can be understood at a glance with respective details in later pages, which represent the company's serious and comprehensive activities.
I have received a polite reply to the reports on the environmental report prepared and sent by some students of Kyoto Seika University last year, some of whose opinions are reflected in this document. I have realized that communication, which is also included in the environmental policy, is practiced in a favorable way. I am looking forward to future developments.



Mr. Ken Uehara

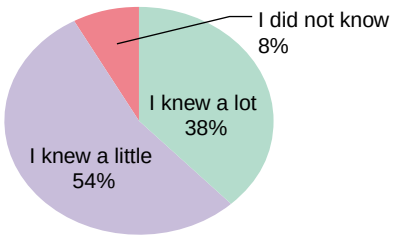
Environmental Management System Auditor
Environmental Planner of Earth Republic
Full-time Manager, Survey and Research Department
Technofer, a JAB-accredited training organization

I feel that the NGK Spark Plug Group a truly sincere company because, on the significant issue of CO_2 emissions, they consider total emissions rather than emissions per unit production, and their violations and complaints are comprehensively published. I guess that their way of manufacturing products is also sincere. I also praise the company for paying attention to a wide range of indirect environmental issues such as the generation of red mud in association with the refining of alumina. On the other hand, it might be better if the NGK Spark Plug Group had characteristic activities which symbolized the environmental activities of the group.
In this context, as I hear that frogs, which are the main feature of the ECO report, are decreasing in number worldwide, how about developing environmental activities with a slogan such as "Protecting the environment where even creatures sensitive to air and water pollution like frogs can live"?

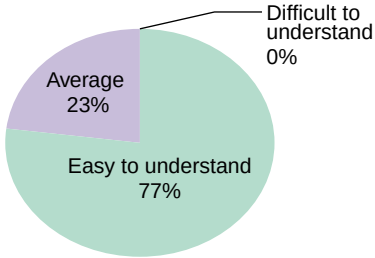
Results of questionnaire in ECO report 2004

Thank you for sending us all your answers to the questionnaire in the ECO report 2004 published in FY2004. We take your opinions seriously and are working to implement even more thorough information disclosure.

Q1 Did you know the environmental conservation activities of NGK Spark Plug Co., Ltd.?



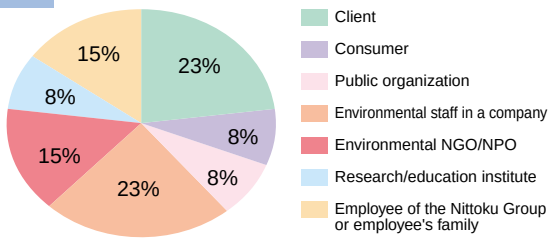
Q2 How did you find the ECO report 2004?



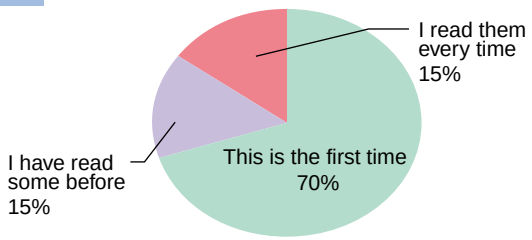
Q3 What did you find the most impressive or interesting topics? (Top 3 answers)

- **Business activities and environmental impact**
- **Basic philosophy on the environment**
- **Chapter 2: Factory/Office**

Q4 From what position mainly did you read the ECO report 2004?



Q5 Have you read any of the ECO reports we published before?



Q6 Please write down any opinions and /or requests you may have for us on its environmental conservation activities.

- **There are too many foreign words. I need explanations.**
- **How about preparing a report based on corporate social responsibility?**
- **The report contains some activities that our company also needs to introduce, and I have learned a lot.**

Third party examination

We prepare this ECO report based on our policy of conducting information disclosure in an easily understandable manner. ECO report 2005 underwent a third party examination by TÜV Rheinland Japan, which also examined last year's report. The examination was made by verifying whether or not important environmental information is comprehensively disclosed, whether or not the disclosed data is accurately measured or calculated, and whether or not the described information is consistent with the supporting materials.



TÜV

Third party verification report
regarding the
"ECO Report 2005" issued by NGK SPARK PLUG Co.,LTD.

To: NGK Spark Plug Co., Ltd.
Mr. Norio Kato, President

2005-07-21
TÜV Rheinland Japan Ltd.
Ralf Wilde, President

1. Scope, purpose and subject of verification
NGK Corporation (hereinafter referred to as the organization) has prepared the "ECO report 2005", covering environmental issues and other reporting areas. TÜV Rheinland Japan Ltd. has been commissioned as an independent third party to implement a specific and agreed-upon verification process with the purpose to confirm rational calculation methods and to verify completeness of disclosed important data including environmental accounting and consistency between other indicated information and basic information of the organization. Written information about "social responsibility" was qualitatively confirmed but not quantitatively verified upon our agreement with the organization.

2. Verification process
The following verification process has been performed at NGK Corporation's Head Office factory, Komaki Factory, Miyanojo factory and Ise factory based on the agreement with the organization.

(1) Outline of environmental management: to understand and consider the organization's situation, overall condition of operation, and to select data items.
(2) Process of data collection, calculation and reporting: basic information pertaining to environmental performance indicators and environmental accounting indicators, the data collection process and the calculation method were examined.
(3) Accuracy of data: for the environmental performance indicators and the environmental accounting indicators, the accuracy of data and reliability of calculations have been assessed by comparing selected data with basic information, and confirming their consistency.
(4) Correctness of other information: other information indicated in the report has been confirmed by interviews with responsible persons, on-site visit and comparison between internal and external information.

The eleven Japanese affiliated companies covered by the report have not been visited in this context, but the accuracy of information regarding the data collection process, calculation methods, and the implementation of environmental management have been verified during periodic ISO14001 audits at those sites.

The above process is deemed rational and sufficient to meet the objectives of verification.

A generally recognized international standard for the verification of environmental information reporting has not yet been established. Therefore, the verification is based on the Ministry of Environment's "Environmental Reporting Guidelines" and the corresponding Environmental Report Assessment Standard, as well as otherwise published good practices and guidelines.

3. Conclusion
The verification process has been performed as planned, and it was confirmed that corrective action requested during the verification has been properly implemented. As a result, the audit team concludes that the processes of data collection, data processing and reporting are appropriately implemented, and that the report covers and correctly indicates important environmental information based on the Ministry of Environment's "Environmental Reporting Guidelines".

Undergoing the third party examination

We received a high evaluation on our stance of positively promoting information disclosure and establishing a mechanism to collect and organize data on environmental impact. It was also indicated that the published data and assessment and effect on the implemented items are difficult to understand.
We respectfully accept this evaluation and will strive to continually enhance the highly evaluated aspects and improve the insufficient points.
We have improved the parts that were lacking in description. We acknowledge that the parts where immediate improvement is not possible due to the inadequacies of our group's system are our future challenges, and will improve our system in these areas.

Request to answer the questionnaire

Thank you for reading through our ECO report 2005. For the further improvement of this report, we kindly ask you to fill in the attached questionnaire.

Please fax the completed questionnaire to : → +81 52-872-5942

*** You can also fill in this questionnaire at the following website : → http://www.ngkntk.co.jp/environment/**

Personal information protection policy

We will only use your personal information to delivery next year's ECO report to you. Even when we publish the results of this questionnaire, we will not show it in a form in which the respondents can be identified.

...and acting accordingly.



ECOreport 2005

NGK SPARK PLUG CO., LTD.
14-18, Takatsuji-cho, Mizuho-ku, Nagoya, Aichi Pref. 467-8525
http://www.ngkntk.co.jp

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Printed with soy ink in the interest of the global environment.