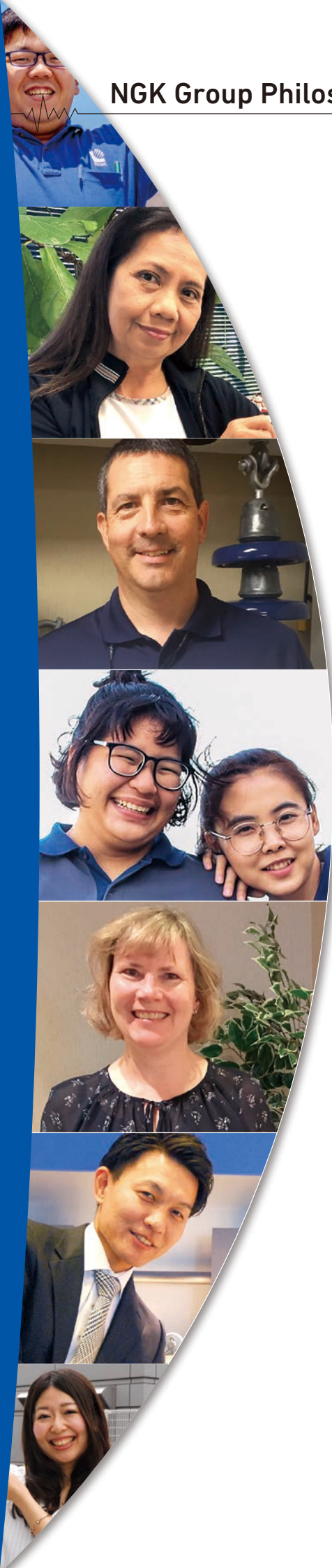


 **NGK INSULATORS, LTD.**

NGK Sustainability Data Book 2019



NGK Group Philosophy



NGK Group Philosophy

Our Mission

**Enriching Human Life
by Adding New Value to Society.**

Our Values

- | | |
|------------------------------|---|
| Quality of People | Embrace challenges and teamwork. |
| Quality of Product | Exceed expectations. |
| Quality of Management | Social trust is our foundation. |

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Establishing the NGK Group Philosophy

The NGK Group has used the occasion of our 100th anniversary to take a new look at the philosophical framework and established the NGK Group Philosophy. Simply put, we seek to capitalize on our history of diversification and global expansion within many different industrial fields, driven by our unique ceramics technology, in order to contribute to the future for energy, the protection of the globalization, and advances in industrialization, all for the sake of bringing happiness and wellbeing into the lives of people everywhere.

We made the NGK Group Philosophy straightforward and concise so that it can be easily understood by the NGK Group's many and varied employees throughout Japan and around the world. We hope that it will serve as the foundation for all members of the NGK Group to act in unity and with a common purpose so that we can achieve our best performance.

Visit the "About NGK" section of our website to read the NGK Group Philosophy.
<https://www.ngk-insulators.com/en/info/governance/>

Editorial Policy

The NGK Sustainability Data Book 2019 reports details of the NGK Group's ESG information. Stakeholders can find separate information on what strengths the NGK Group has to offer, how we are creating value, how we plan to grow further, and how we are contributing to sustainable development of society and the entire world in the NGK Report 2019. This data book has been prepared and edited in line with the Global Reporting Initiative (GRI) Sustainability Reporting Standards.

Target Organization Indicated along with each article and data report included in this data book.

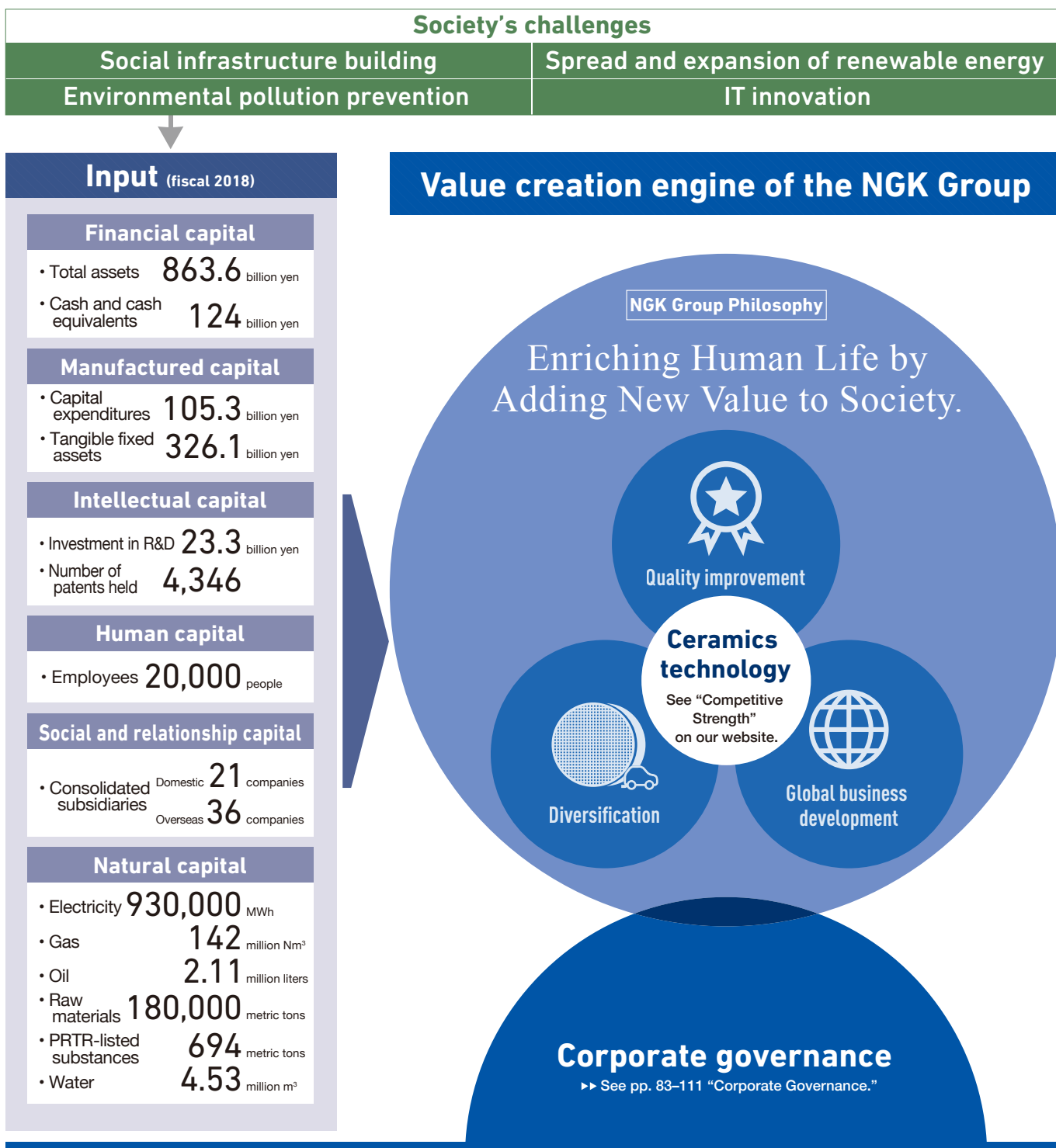
Target Period April 1, 2018 to March 31, 2019



Value Creation by the NGK Group

Using Advanced Technology to Power a Unique “Value Creation Engine”

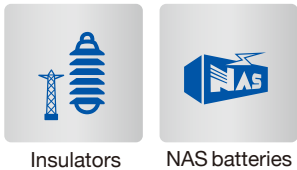
Thanks to the unique ceramics technology it has cultivated over many years, the NGK Group is able to develop a wide variety of high-quality products that it seeks to offer in a growing range of overseas markets. As a result, the NGK Group creates diverse value, which helps to address society’s challenges.



Reference URL	Competitive Strength	https://www.ngk-insulators.com/en/sustainability/value02.html
	Business Overview	https://www.ngk-insulators.com/en/info/division/index.html
	Position on SDGs	https://www.ngk-insulators.com/en/sustainability/management02.html

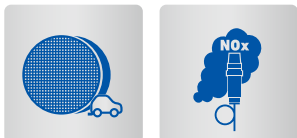
Output

Power business



Insulators NAS batteries

Ceramic products business



Ceramics for purifying automobile exhaust NOx sensors

Electronics business



Ceramics for electronic and electrical devices Beryllium-copper products

Process technology business



Ceramics for semiconductor manufacturing equipment Industrial machinery and devices

Results (fiscal 2018)

Consolidated net sales

463.5 billion yen

Net income attributable to owners of the parent

35.5 billion yen

ROE

7.6 %

Total sales of products contributing to environmental protection

258.9 billion yen

Social contribution spending

0.3 billion yen

Avoided NOx emissions

4 million metric tons per year

Note: Assumes exhaust systems are equipped on new automobiles that do not have equivalent systems.

Values provided by the NGK Group

Supporting social infrastructure



Ensure access to affordable, reliable, sustainable, and modern energy for all

- Insulators are indispensable to stable power supply
- NAS® batteries allow stable supply of renewable energy



Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation

- Ceramics used in electronics make ICT cheap and ubiquitous
- Ceramics used in semiconductor manufacturing equipment let the semiconductor industry be the foundation for modern daily life
- Metal products are widely used in mobile phones, automobiles, industrial equipment, and other devices that undergird modern life

Protecting the environment



Ensure access to affordable, reliable, sustainable, and modern energy for all

- Ceramics for purifying automobile exhaust make exhaust gas clean, thus enabling clean usage of fossil fuels



Take urgent action to combat climate change and its impacts

- NAS batteries aid in the fight against climate change by allowing stable supply of renewable energy



Conserve and sustainably use the oceans, seas, and marine resources for sustainable development

- Ceramic membrane filters purify wastewater to prevent marine pollution

Improving people's lives



Ensure healthy lives and promote well-being for all at all ages

- Ceramics for purifying automobile exhaust make exhaust gas clean



Ensure availability and sustainable management of water and sanitation for all

- Ceramic membrane filters provide highly safe water
- Ceramic membrane filters purify wastewater



Make cities and human settlements inclusive, safe, resilient, and sustainable

- NAS batteries enable innovation in urban energy management for the creation of sustainable cities

Competitive Strength

Competitive Strength Built on the Relentless Pursuit of Ceramics Manufacturing Optimization

From its very beginning, the NGK Group has sought to reexamine conventional ceramics manufacturing practices in light of the latest science and technology in order to help it identify the optimal combination of process conditions for each of its products. And after nearly 100 years, this pursuit of optimization has accrued a wealth of technology and expertise from which the NGK Group draws its competitive strength.

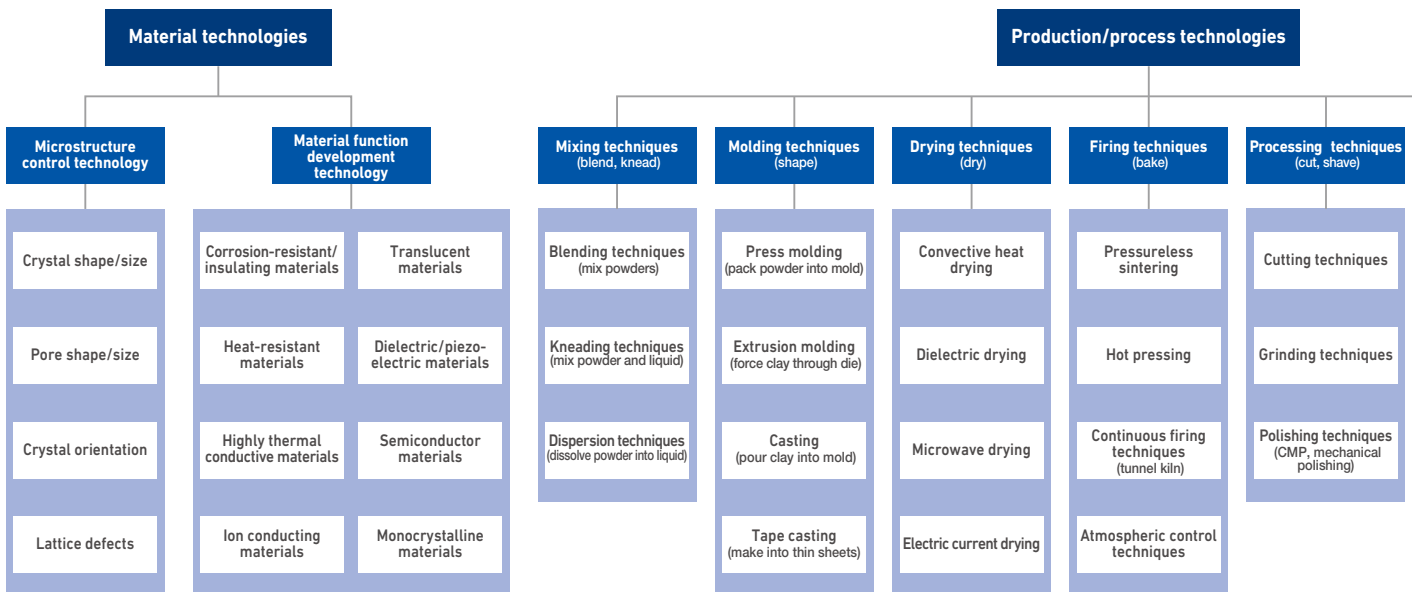
Mixing, molding, and firing. A puzzle with endless combinations.

Ceramics manufacturing is patient, methodical work, which requires you to blow life into inanimate material that is hard and brittle. You start by choosing from among tens of thousands of raw ingredients that will provide the best combination suited to your needs, and then you mix them. After you have calculated what shape your product needs to have after firing, you mold

it. Finally, you perform firing to achieve the optimal microstructure and component structure in your product.

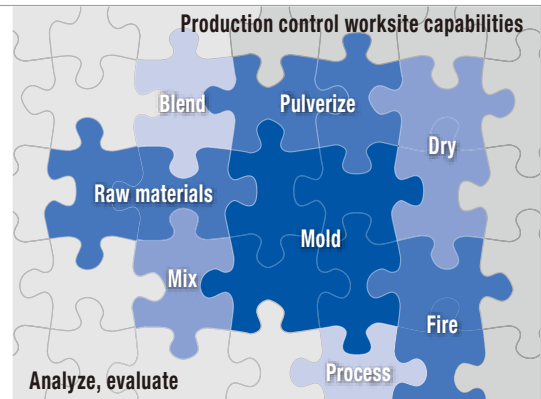
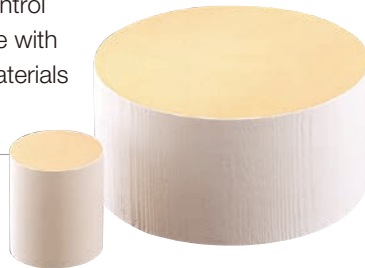
This interconnected series of processes involves an almost unlimited number of parameter combinations. Each product is like its own, complex jigsaw puzzle, and every piece is essential.

■ NGK Core Technologies



Key technology in the manufacture of the HONEYCERAM® ceramic catalytic converter substrate for automobile exhaust purification

In order to ensure product uniformity, it is essential that we perform on-site analysis, evaluation, production control, and other measures that allow us to control the production process in line with the slight variations in raw materials characteristics of each lot.

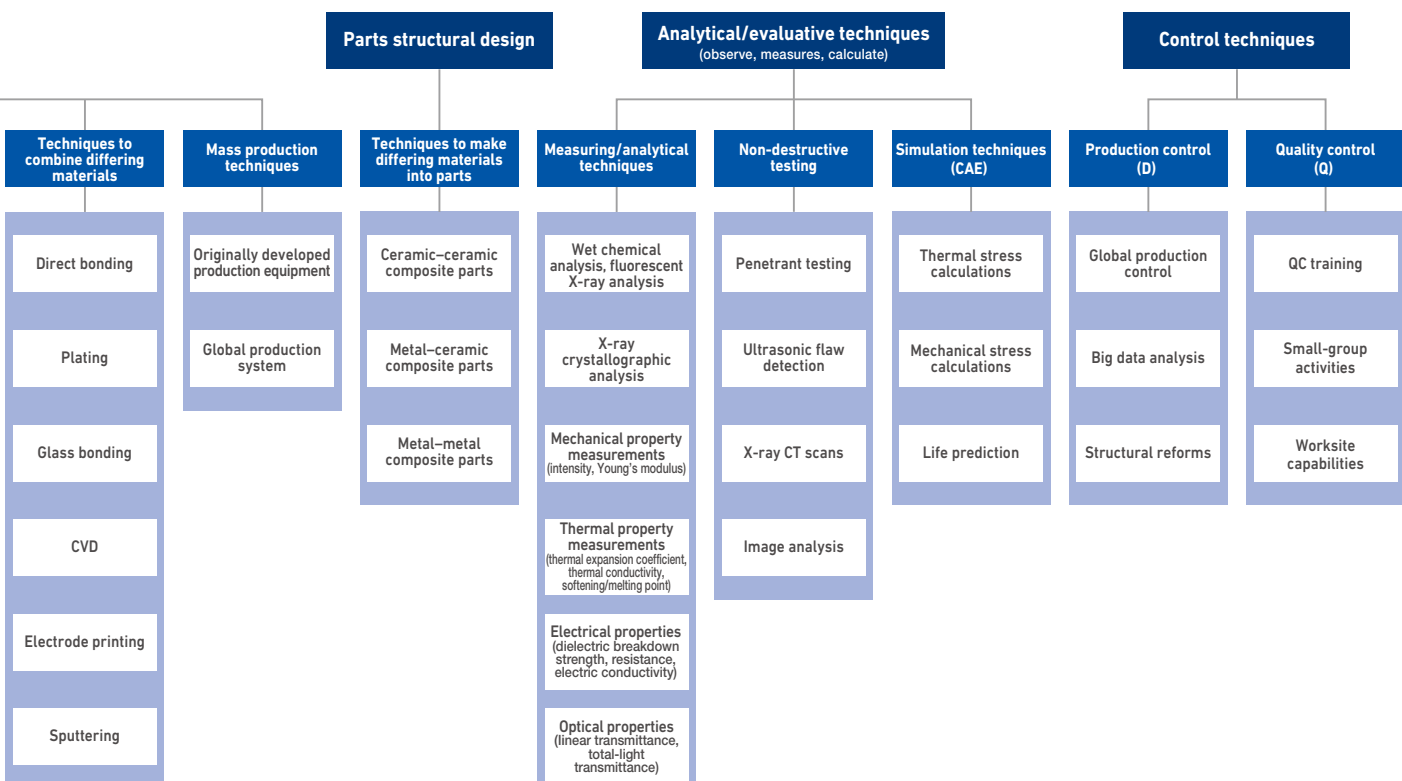


Achieving uniformity in mass production can take 10 years or more

Uniformity, i.e., little to no variation, is essential for industrial products. This is particularly true for insulators, which the NGK Group has been manufacturing since its founding. A single broken insulator will knock out the entire power transmission line; thus, strict quality control has always been necessary. As a result, the pursuit of uniformity has become embedded in the very corporate DNA of the NGK Group.

We methodically search for the optimal and most cost-efficient combination of parameters to use in the mixing, molding, firing, and other processes, and then

we steadily work to improve these to achieve uniformity in mass production. Finalizing each process takes a great deal of time; with difficult products it can take 10 years or more. At NGK, our starting point is, and has always been, an uncompromising management policy combined with methodical diligence on the job. This is the reason why NGK products—from insulators to HONEYCERAM, NOx sensors, NAS® batteries, and semiconductor manufacturing equipment products—are so far beyond anything our competitors have to offer.



Message from the President



Establishing our philosophical framework: A clearer and more memorable expression of our core convictions

In January 2019 we announced the NGK Group Philosophy as our revised philosophical framework. Our mission is “Enriching Human Life by Adding New Value to Society,” and we seek to achieve this by focusing on the values we have set for ourselves with regard to quality of people, quality of products, and quality of management.

In revising the philosophical framework, we sought to ensure, through the words we chose, that our philosophy is both memorable and easily grasped. The NGK Group is committed to preserving the global environment, fostering the development of industry, creating a brighter energy future, and contributing to the wellbeing and happiness of people around the world. It is this longstanding desire to be such a company through the products and services that we offer which we have encapsulated within a clearer and more memorable corporate philosophy.

We also sought to ensure that our corporate philosophy is expressed in a way that can be shared by

everyone in the NGK Group. There are approximately 20,000 employees in 20 countries around the world who make up the NGK Group. As our business has diversified and expanded globally, the employee makeup of the NGK Group has been changing significantly. In order for there to be mutual respect and group cohesion from which our best performance can be attained, it is important that everyone in the Group is committed to the common mission and share the same values. Thus, we have chosen simple and concise wording that resonates universally and is accessible among all NGK Group members who have different cultures and languages.

This new expression of our corporate philosophy is a core around which the NGK Group can come together to not only further refine our ceramics technologies but also to revisit our founding principles as we keep working to improve the quality of the products that we provide and the work that we perform in pursuit of our corporate mission.

Capitalizing on What We Have Built to Become a Truly Global Company

On May 5, 2019, the NGK Group marked the 100th anniversary of its founding. The journey of growth that has brought us here would not have been possible without the support of our customers, shareholders, local communities of where we do business worldwide, and our many other stakeholders. For this I offer my heartfelt gratitude.

Looking ahead, we want to capitalize on all that the NGK Group has built up to this point and apply our unrivaled technological strength to the development of products that exceed society's expectations and allow us to contribute to the world as a truly global company. We would like you to expect to see further development of the NGK Group in the future.

NGK Insulators, Ltd.
President



Corporate culture reform: Facilitating essential work performance

The NGK Group needs to do better on a variety of different fronts. Regrettably, since the start of my tenure as president, the NGK Group was found in 2015 to have engaged in an anti-trust laws violation issue and, in 2018, to have caused the non-conformity in testing procedure of insulators and related products. These problems stem from a longstanding and lingering lack of frank communication.

In order to try and effect a fundamental cultural shift in this regard, I have increased the number of visits I make to our many different workplaces. So far I have averaged around 70 workplace visits per year. During my visits I make myself available to employees so that they can tell me about any problems or concerns they may have, or about any ideas they may have for improvements. Recently, my efforts are being rewarded as more and more employees share their thoughts with me and talk about what initiatives they are undertaking.

One department, which is 70% female, has created a workplace built based upon the needs of women and ensuring a healthy work-life balance. In one of the product engineering departments, where the busy pace of work is almost constant, a series of small improvements and novel rules have been introduced, which ensure employees are actually able to get time off.

These examples are the results of an invigoration of corporate culture within the NGK Group that has been occurring in the wake of personnel system reforms implemented in 2017. This innovation in corporate culture is taking place alongside ongoing and persistent communication efforts aimed at encouraging employees to focus on what is essential in their work and have the courage to abandon what is not. In fact, just by talking with employees, I increasingly get the sense that attitudes are changing.

Message from the President

However, in order to ensure the continued momentum of these sorts of initiatives, the attitudes of those at the management level need to change so that they can lead by example. Ten senior executives, including executive vice presidents, have announced changes they are making in their department and have

followed up on the status of implementation. We call these initiatives “quality management,” and by ensuring their thorough, company-wide implementation we seek to alter the corporate culture in ways that will facilitate an improvement in the quality of work we perform.

Instituting the ESG Committee: Clarifying and ranking priorities

With the aim of achieving sustainability on a global scale, increasing attention has been paid in recent years to sustainable development goals (SDGs) and environmental, social, and corporate governance (ESG) policies. In order to strengthen the NGK Group’s initiatives in these areas, we established the ESG Committee in April for which I serve as chairman and which is attended by other board members.

At the meetings of this committee, I and the other senior management engage in wide-ranging discussion

about environmental practices, quality, safety, and other corporate policies at NGK. Through these discussions we seek to clarify what our priorities are and to prioritize them. Right now, with our current Five-Year Environmental Action Plan set to conclude in fiscal 2020 and deliberations beginning for the next five-year plan, we are solidifying our policies with regard to reducing CO₂ emission intensity and increasing the amount of renewable energy we purchase.

Business overview and future outlook: No change in production increase investments

Fiscal 2018 was a year of drastic market fluctuations. Initial performance predictions were revised for the latter half of the year and, later, had to be revised downward even further, ultimately resulting in decreased profits compared to the previous year despite achieving record-high sales. Group performance was negatively impacted by a variety of factors, including expanding

deficits for the Power Business, shrinking profits in the Electronics Business, and operating loss on liquidation of our Chinese insulator manufacturing subsidiary.

Fiscal 2019 also presents us with a chaotic global economic situation stemming from economic friction between the U.S. and China, Brexit, problems in the Middle East, and many other factors. Nevertheless, for our automotive-related business, we anticipate that the more stringent exhaust standards being enacted in various countries will drive major demand for gasoline particulate filters (GPFs) used to remove particulates from gasoline-powered automobile exhaust. Also, there was overall business growth for automotive diesel particulate filters (DPFs), spurred on primarily by demand from large vehicles. Sales of NO_x sensors are also growing as a result of more and more customers utilizing multiple NO_x sensors per vehicle. These are contributing to an overall upward trend that is expected to continue for automotive-related products. Looking at our electronic components-related business and other business segments, the situation is good with a host of new products coming out one after another. In the power business segment, NGK is removing unprofitable



products, conducting large-scale streamlining via redeployment, and taking steps to improve productivity so as to return to profitability as quickly as possible.

Currently, there is no change in the status of the roughly 300 billion yen NGK is investing to increase production. For GPFs this year, in addition to starting up a second plant in China, NGK will increase production in Poland as well. Also, the new plant in Tajimi, Gifu Prefecture will begin production of ceramics for semiconductor manufacturing equipment in the fall. This

plant is characterized by its integrated production system that will boost output by roughly 30% and productivity by around 40% compared with existing plants. This will enable us to finally meet customer demand.

In Fujiyoshida, Yamanashi Prefecture, we will be launching a new plant that will help us meet the growing demand for electronic components, as well as handle production of new products being introduced more widely on the market.

Strengthening Our Global Production System (Major Bases)

● Ceramic products business base ● Process technology business base

NGK Ceramics Polska 2nd plant

Increase production capacity of SiC-DPFs (No. 2 Building)



NGK Ceramics Polska 1st plant

Facilities for assembling sensors

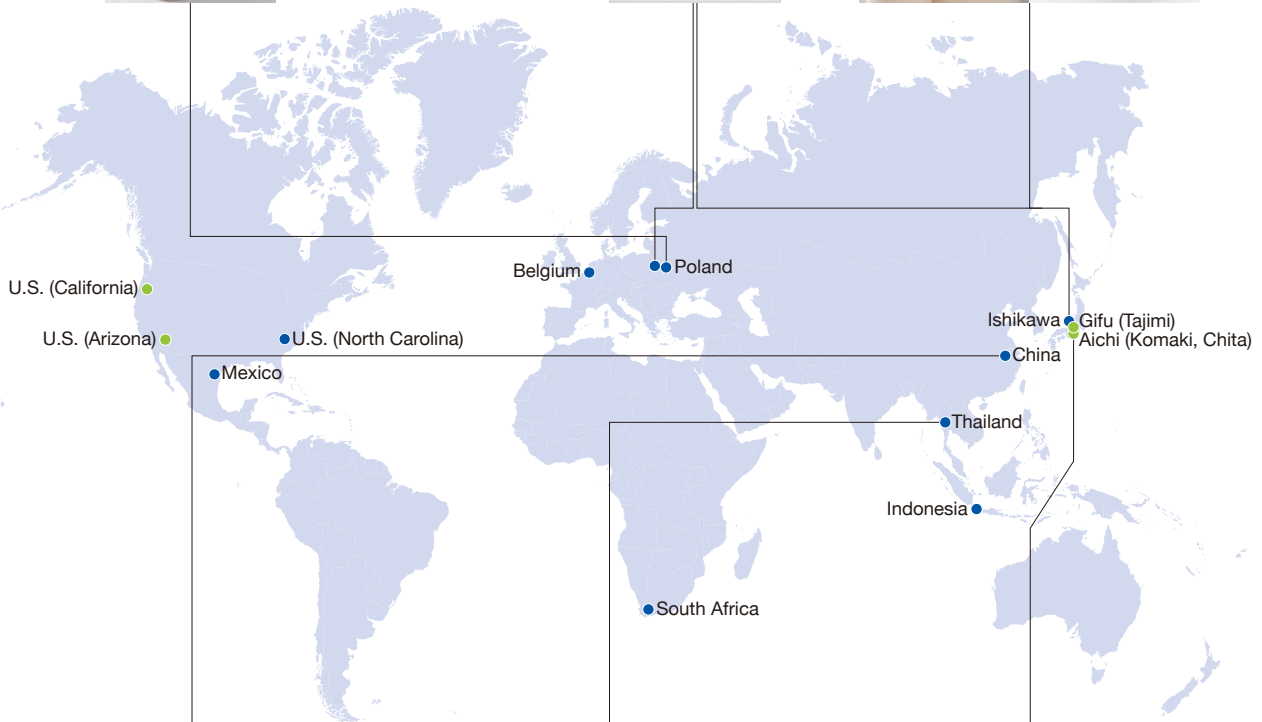
NGK Insulators Ishikawa Plant

Production facilities for sensor elements



NGK Insulators Ishikawa Plant

Increase capacity of raw material mixing equipment



NGK Ceramics Suzhou 2nd plant

Mass production of GPFs



NGK Ceramics (Thailand)

Mass production of LSH



NGK Ceramic Device Tajimi Plant

Increase production capacity of ceramic products for semiconductor manufacturing equipment



Message from the President

From the various initiatives undertaken by NGK have emerged new products that anticipate future demand. A good example is the EnerCera® chip-type ceramic secondary battery. These lithium-ion secondary batteries utilize NGK's own crystal-oriented ceramic plate as electrodes to achieve high energy density within a small and thin body. They have been well received in the industry. One prominent technology journal has lauded their outstanding performance, and at the CES 2019, the world's largest consumer electronics trade show, the batteries received the Innovation Award.

Following sample shipments to customers, we

began mass production this April. Used as a power source, these batteries can be used to improve security and convenience, such as by incorporating them into credit cards to power fingerprint authentication or wireless communication. They attracted a high degree of interest from automakers at CES, due to the fact that these batteries can be used with smart keys to resolve the recent problem of car theft that has arisen as a result of thieves performing fraudulent unlocking via exploitation of weak electromagnetic signals. We are very excited about the future of this product.

R&D: Investing financial and human resources in targeted fields to meet the needs of the era

In order to ensure the continued growth of the NGK Group in the medium and long term, we must keep developing products focused on the needs of the next era. This is why we treat active investment of human and financial resources into R&D as a fundamental part of our business.

For the current term, we plan on spending 25 billion yen on R&D, which is equivalent to 5% of our sales. This amount is roughly double what it was five to six years ago. This means there are many research fields we should invest in. In addition to basic R&D activities, we also pursue development and joint research focused on the specific needs of customers.

Our R&D policy is to target growth markets and those fields where our distinctive technology can give us a competitive advantage. We have adopted this policy based on past experience that has taught us that trying to cover as many fields as possible ends up producing very little in any one field. For example, it was by successfully capitalizing on our own crystalline orientation technology that we developed EnerCera®.

One product that has emerged from our R&D for which we anticipate future demand is our gallium nitride (GaN) wafers. These wafers are incredibly defect-free (i.e., little positional aberrations of atoms in GaN crystals), making them suited for use in the base substrates of semiconductor laser devices, power semiconductors, and 5G high-frequency wireless communication amplifiers (high-frequency devices). These wafers are already available for commercial applications in semiconductor laser devices. However, just like silicon wafers, this material is one that will underpin a variety of different industries, which means it has interesting potential in power semiconductors and high-frequency devices, as well. As plug-in hybrid vehicles (PHVs) and electric vehicles (EVs) become more widespread, a variety of commercial applications for these wafers will emerge, such as in the light source of laser headlights, or in the on-board inverter required for electrification of vehicles.

We are already developing and introducing products to meet these needs.

Another commercial application that we are currently developing and which is geared towards PHVs and EVs is an all-solid-state battery that we call "all-ceramic battery." Many companies make use of a sulfide-based electrolyte, but the NGK Group has adopted an oxide-based ceramic material, which is highly safe. While this makes it more difficult to manufacture due to the fact that crystalline orientation technology is required, we are well along in the development process thanks to our existing ceramic material technologies, which we can capitalize upon.

Additionally, a demonstration testing with large ceramic membranes for CO₂ separation that we are currently developing will be launched soon. When CO₂ is injected into oil fields, it improves the fluidity of the highly viscous crude oil and allows more of it to be extracted, but the associated gas that emerge with oil extrusion contain CO₂ as a contaminant to methane gas that is major component of the associated gas. These membranes would be used to separate CO₂ from useful methane gas. This separated CO₂ can once more be injected into the oil field. Not only does this increase the amount of crude oil extracted, it traps a portion of the CO₂ within the ground, thereby helping to mitigate global warming.

With regard to the development of solid oxide fuel cells (SOFCs), a basic agreement has been concluded by four companies in the Morimura Group—Noritake, TOTO, NGK Spark Plug, and NGK Insulators—to establish a four-party joint venture.

SOFC systems are small-scale power generation systems that achieve output efficiency equal to or exceeding that of large, cutting-edge thermal power stations. There is great expectation surrounding this technology in terms of how it can contribute to the realization of a low-carbon society. The details of the joint venture is now under discussion by the four participant companies.

Towards the next hundred years: Charting our path for the decade to come and beyond

We see our current blueprint for NGK up through 2030 as being realistic. In the areas of automobiles, semiconductors, batteries, and much more, our existing derivative technologies have a variety of potential applications that will keep current growth trends going.

However, with regard to questions of social structure and humanity's needs from 2030 onward, more study is needed. Global demographics are inexorably changing, and it will not be long until the central loci of growth shift to Asia and Africa. How will these changes affect spending consumption, and what is required to adapt to them? What will already well-established developed countries need in this changing world? Extrapolating backward from these predictions, what do we need to be doing now in order to prepare? We should be devoting our creativity and time to considering these questions.

Moreover, the fate of humanity depends on whether we can reduce CO₂. Surely this is a challenge that the entire world needs to come together to address. In this sense, it is a challenge that presents us with business opportunities. For example, in order to meet the ever-growing need for renewable energy, storage batteries such as our NAS[®] batteries capable of large-scale and long-term power discharge are indispensable.

Reflecting upon the situation in the NGK Group reveals that we, too, need to invest more time and resources on achieving better thermal efficiency, cutting energy consumption, and reducing emissions connected with our use of kilns to fire ceramics. In the mind of the public, having a focus on ESG is taken as a given, and there has been a pronounced trend among investors as well to choose companies that emphasize ESG. Discussion of how best to incorporate ESG into corporate policies is ongoing.

In January of each year, I announce to the company my key *kanji* character for that year, but this year I have forgone a single *kanji* in favor of a key phrase: "Never forget the first resolution."

When I reflect on past incidents such as the non-conformity in testing procedure of insulators and the related products, I wonder if they were due in some degree to arrogance on our part. Such an attitude is out of alignment with the founding spirit of our first president, Kazuchika Okura, who declared, "We do this to serve our country, and not for our own profit." This is the sentiment I wanted to convey with this year's key phrase.

I want all of our employees to think once more about why companies exist. A company's survival depends upon its ability to operate within the rules of society in

such a way that a relationship of trust is established. On the occasion of our 100th anniversary, I want that thought to be the starting point of our new journey.

We have cultivated a great many seeds that can grow into future business. If we sow them with confidence, I believe they will reward us with results. Our preparations for the next five to ten years are largely in place. And it is my hope that we will look to the future beyond that and make use of this year as a fresh start.



CSR Management

CSR Activities Concepts and Systems

The NGK Group seeks to provide new value to society with our unique technology, and contribute to improving quality of life, foster the development of industry, and conserve the global environment. It seeks to do all of this in a way which is socially responsible and which wins the positive expectations and trust of society.

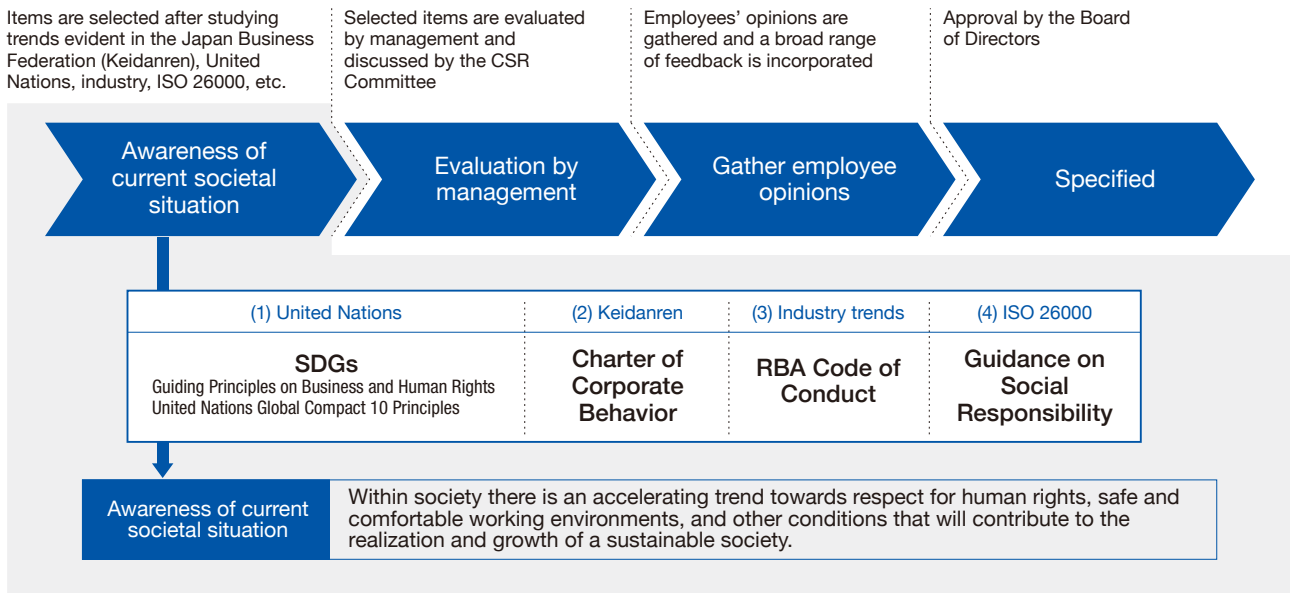
NGK Group Code of Conduct	Initiatives	KPIs
1. Realization of a Sustainable Society We will create new value through the provision of products and services that contribute to society, protect the world environment, and strive to realize a sustainable society.	<ul style="list-style-type: none"> Quality objectives Overhaul and thorough strengthening of quality assurance measures 	Number of inspection sites, time spent on inspections
	<ul style="list-style-type: none"> Introduction of QuiC quality improvement activities Strengthening of quality management system (QMS) training Quality-related education 	Number of participants
2. Respect for Human Rights We will strictly comply with international standards of human rights and respect the diversity of all people.	<ul style="list-style-type: none"> Signed on to UN Global Compact Participation in outside study groups Human rights due diligence 	Number of participations in study group, number of participants
	<ul style="list-style-type: none"> Education via in-house training Diversity promotion Expansion of job opportunities for the disabled 	Number of participants Employment rate of persons with disabilities Number of female managers (percentage)
	<ul style="list-style-type: none"> Establishment and publication of helpline Anti-harassment training 	Number of helpline consultations
3. Provide a Safe and Enjoyable Work Environment We will provide a safe and enjoyable work environment that is comfortable for everyone to work in for all.	<ul style="list-style-type: none"> Acquisition of international standards certification 	External certification coverage rate
	<ul style="list-style-type: none"> Initiatives to reduce long work hours Initiatives to facilitate work-life balance Raising of mandatory retirement age, etc. 	Rate for taking of paid leave Number of system users
	<ul style="list-style-type: none"> Investigation of how to achieve organizational activation Labor-management initiatives 	Frequency
4. Honest Business Activities We will undertake fair and transparent business activities with integrity and strictly comply to international standards, laws and regulations of each country and region.	<ul style="list-style-type: none"> Human resource development 	Number of participants Training cost
	<ul style="list-style-type: none"> NGK Group Code of Conduct Compliance-related education 	Number of sessions Number of participants
	<ul style="list-style-type: none"> Quality-related education Helpline Restructuring of quality-related activity framework 	Number of sessions, number of participants
	<ul style="list-style-type: none"> Initiatives to strengthen compliance with the Competition Law 	Number of sessions, number of participants
	<ul style="list-style-type: none"> Implementation of bribery-related education 	Number of participants
	<ul style="list-style-type: none"> E-learning 	Number of participants
	<ul style="list-style-type: none"> Lectures Utilization of administration systems Study groups 	Number of participants Number of e-learning participants Coverage rate Number of participants
5. Disclosure of Company Information and Accountability We will increase healthy and transparent management by active disclosure of information and discussion with stakeholders.	<ul style="list-style-type: none"> Corporate risk surveys (CRS) Establishment of a helpline Raising of awareness about whistleblower system (hotline) 	Response rate, improvement rate Results
	<ul style="list-style-type: none"> Publication of NGK Report and NGK Sustainability Data Book Website News releases 	
6. Permeate Social Responsibility into our Supply Chain We will promote a structure that fulfills societal responsibilities to our trade counterparts and the supply chain overall.	<ul style="list-style-type: none"> Investor relations (IR) Booths at IR and investment fairs 	Frequency, number of participants
	<ul style="list-style-type: none"> Business results briefing sessions Establishment of helpline for business partners Thorough enforcement of CSR Procurement Guidelines and Green Procurement Guidelines Written consent Individual visits 	Rate of consent Number of visits
7. Preservation of Environment We will work to preserve and resolve the problems of the world environment.	<ul style="list-style-type: none"> Development and provision of products contributing to environmental protection 	Sales ratio
	<ul style="list-style-type: none"> Five-Year Environmental Action Plan Introduction of environmentally friendly processes Net-zero energy buildings (ZEBs) Reduction in CO₂ from distribution processes 	Achievement rate of five-year plan
	<ul style="list-style-type: none"> Biodiversity surveys of company-owned site Acquisition of ISO 14001 certification 	Rate of acquisition
8. Cooperation with the Region and Society We will contribute to the expansion of the region and society as a good corporate citizen.	<ul style="list-style-type: none"> Support for foreign students Science volunteers 	Number of supporters, amount of money
	<ul style="list-style-type: none"> Participation in Table for Two initiative, provision of marathon volunteers 	Number of meals, number of participants

Relationship to SDGs

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Revision Process for the NGK Group Code of Conduct

In setting CSR promotion items, we have disclosed eight items in the NGK Group Code of Conduct in order to establish a framework that is integrated with the Code of Conduct while disclosing information and restructuring activities.



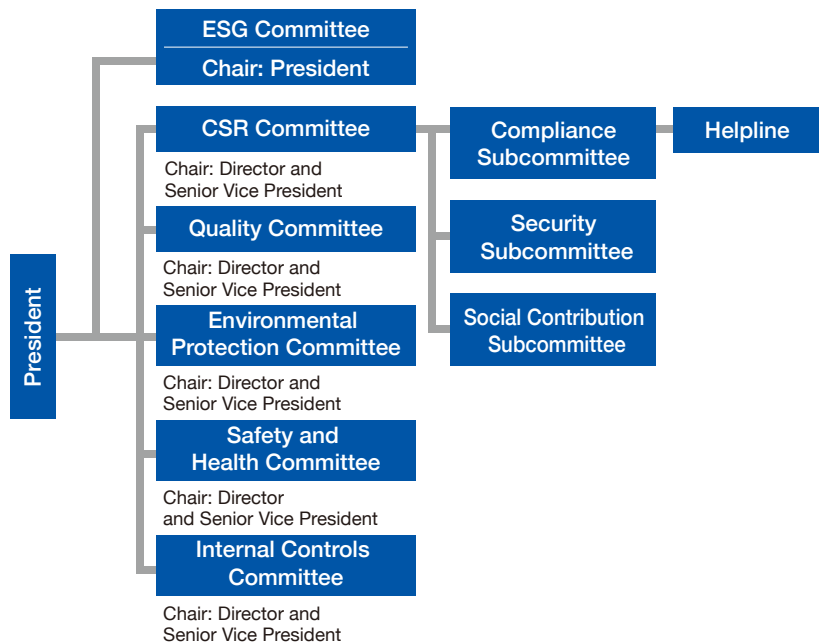
Reference URL

NGK Group Code of Conduct <https://www.ngk-insulators.com/en/sustainability/guideline/index.html>

CSR Promotion Framework

To promote CSR activities, the NGK Group has established the CSR Committee, the Environmental Protection Committee, the Quality Committee, the Safety and Health Committee, and the Internal Controls Committee.

In terms of legal and corporate ethics compliance activities, the CSR Committee discusses items necessary to assist decision-making by the president and CSR Committee chair. Also, in April 2019, the ESG Committee was established with the president serving as its chair. In line with the NGK Group Philosophy, this committee discusses management issues pertaining to ESG.



Position on SDGs

The NGK Group is a signatory to the United Nations Global Compact, which advocates for independent action on the part of companies. We believe that addressing a broad range of social problems through our business activities, while measuring progress against indicators such as the Sustainable Development Goals (SDGs) adopted by the UN, is an important corporate social responsibility.

	Goals	Values provided by the NGK Group
	End poverty in all its forms everywhere	<ul style="list-style-type: none"> • Creating appropriate employment helps to end poverty • NGK's climate change countermeasures help mitigate natural disasters
	End hunger, achieve food security and improved nutrition, and promote sustainable agriculture	<ul style="list-style-type: none"> • The social infrastructure created by NGK products helps secure equal access to work opportunities
	Ensure healthy lives and promote well-being for all at all ages	<ul style="list-style-type: none"> • Ceramics for purifying automobile exhaust make exhaust gas clean
	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	<ul style="list-style-type: none"> • Creating appropriate employment gives people the chance to have equal access to education
	Achieve gender equality and empower all women and girls	<ul style="list-style-type: none"> • The social infrastructure created by NGK products helps provide more opportunities for women to enhance their abilities • Securing equal opportunities for women to participate and be leaders in society
	Ensure availability and sustainable management of water and sanitation for all	<ul style="list-style-type: none"> • Ceramic membrane filters provide highly safe water • Ceramic membrane filters purify wastewater
	Ensure access to affordable, reliable, sustainable, and modern energy for all	<ul style="list-style-type: none"> • Insulators are indispensable to stable power supply • NAS® batteries allow stable supply of renewable energy • Ceramics for purifying automobile exhaust make exhaust gas clean, thus enabling clean usage of fossil fuels
	Promote sustained, inclusive and sustainable economic growth, full and productive employment, and decent work for all	<ul style="list-style-type: none"> • Creating appropriate employment and providing employees with a satisfying work environment contributes to economic growth
	Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation	<ul style="list-style-type: none"> • Ceramics used in electronics make ICT cheap and ubiquitous • Ceramics used in semiconductor manufacturing equipment let the semiconductor industry be the foundation for modern daily life • Metal products are widely used in mobile phones, automobiles, industrial equipment, and other devices that undergird modern life
	Reduce inequality within and among countries	<ul style="list-style-type: none"> • We prevent discrimination and take prompt and appropriate action when violations occur
	Make cities and human settlements inclusive, safe, resilient, and sustainable	<ul style="list-style-type: none"> • NAS® batteries enable innovation in urban energy management for the creation of sustainable cities
	Ensure sustainable consumption and production patterns	<ul style="list-style-type: none"> • We efficiently use the natural resources used to make ceramics
	Take urgent action to combat climate change and its impacts	<ul style="list-style-type: none"> • NAS® batteries aid in the fight against climate change by allowing stable supply of renewable energy
	Conserve and sustainably use the oceans, seas, and marine resources for sustainable development	<ul style="list-style-type: none"> • Ceramic membrane filters purify wastewater to prevent marine pollution
	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss	<ul style="list-style-type: none"> • We protect biodiversity on land owned by NGK
	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all, and build effective, accountable and inclusive institutions at all levels	<ul style="list-style-type: none"> • We comply with the rules and regulations of the countries and regions in which do business, and ensure respect for and strict compliance with international treaties
	Strengthen the means of implementation and revitalize the global partnership for sustainable development	<ul style="list-style-type: none"> • We encourage and promote effective partnerships among governments, corporations, and society as a whole

Environmental

NGK Sustainability Data Book 2019

Environmental

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Environment

In addition to promoting the development and popularization of products and services that can help reduce the load on the environment, the NGK Group is endeavoring to preserve the global environment by improving manufacturing processes and developing and introducing manufacturing technology that has less environmental impact.

Activities covered

All NGK Group sites

- NGK Headquarters, Nagoya Site, Chita Site, Komaki Site, Ishikawa Plant, Tokyo Main Office, Osaka Branch, and six other sales offices
- Group companies: 57 consolidated subsidiaries

■ NGK's Core Policy on the Environment

Recognizing that protecting the environment is a vital issue that all of humanity must face, the NGK Group formulated its Core Policy on the Environment in April 1996 based on Environmental Philosophy and Guidelines for Environmental Action in order to bring its corporate

activities into harmony with the environment. On the basis of this policy, the NGK Group works to reduce the environmental impact of business activities, and actively strives to help protect the environment by developing products and technologies to that end.

NGK's Core Policy on the Environment

Environmental Philosophy (revised in June 2019)

The NGK Group continues our commitment to improving the global environment through our "Triple E" businesses representing the energy, ecology, and electronic sectors.

Guidelines for Environmental Action

1. Strive to develop, design, and manufacture products that contribute to the environment and products with low environmental impact.
2. Work to reduce the environmental impact arising from business activities. Conduct design reviews to scientifically study and evaluate the environmental impact of business activities.
 - Promote energy conservation measures for all processes and facilities, and make efforts to control CO₂ emissions.
 - Promote resource saving and recycling, and make efforts to control the generation of by-products.
 - Through the appropriate use and control of chemical agents, work to reduce the risks inherent in toxic substances.
 - Give precedence to environmentally friendly materials, parts, products, and facilities in procurement and purchasing, strengthening cooperative alliances with our business partners.
3. Enhance environmental management systems from a global perspective while continuously reducing our environmental impact.
4. Not only abide by environmental laws, regulations, and other requirements, but also institute voluntary standards and work to improve our own environmental conservation.
5. Provide environmental information to the public at the appropriate time and pursue dialogue with all stakeholders. Proactively develop social action programs. Also, engage in education and publicity in order to improve employees' environmental consciousness.

The site reports posted on the website contain details regarding the environmental impact of each of NGK Group's sites and manufacturing-related group companies both within Japan and overseas, as well as environmental conservation activities in which they are currently engaged.

<https://www.ngk-insulators.com/en/sustainability/sitereport/>

■ Five-Year Environmental Action Plan

The NGK Group has established the Fourth Five-Year Environmental Action Plan (2016–2020). To achieve the goals of the Plan, we are promoting environmental activities, setting annual targets.

Outline of the Fourth Five-Year Environmental Action Plan (2016–2020)

The NGK Group organizes environmental initiatives by creating five-year action plans. The Fourth Five-Year Environmental Action Plan, initiated in fiscal 2016, has been formulated to broadly encompass major global environmental challenges that businesses are expected to take, and to select two key issues each for two groups of themes, namely, priority themes and focus themes.

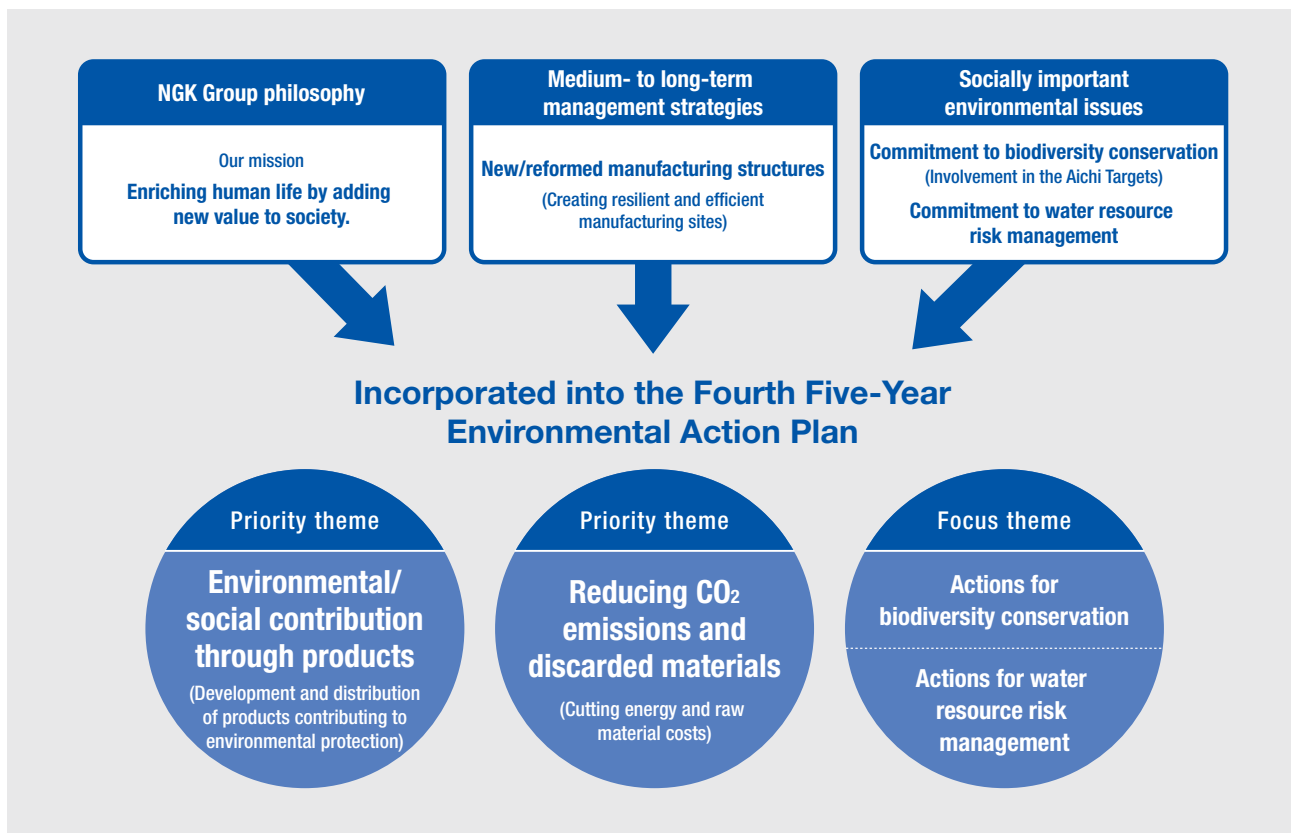
The two priority themes are: environmental/social contribution through products; and reducing CO₂ emissions and discarded materials. The first priority theme directly reflects the core concept of the corporate philosophy, while the other theme closely relates to NGK's medium- to long-term initiative of New/Reformed Manufacturing Structures for increasing competitiveness. For focus themes, we have also set two issues: biodiversity conservation and water resource risk

management/response, both being major challenges for which socially responsible corporate action is required with greater urgency.

Base Year, Target Year, Control Scope

Base Year: Fiscal 2013; Target Year: Fiscal 2020

The new Five-Year Environmental Action Plan has been designed to correspond with the business initiative of New/Reformed Manufacturing Structures. Accordingly, the base year and target year of the Plan have been set to coincide with the initiative. In principle, activities will be managed on a consolidated basis, embracing those based in and outside Japan, in place of the previous method of managing domestic and overseas activities separately. The consolidation method has been adopted to improve management efficiency and effectiveness in response to the recent changes in our global production output structure, particularly increased amounts from overseas manufacturing sites as well as from production chains through multiple global locations.












Five-Year Environmental Action Plan Progress Report

The initiatives planned under the Fourth Five-Year Environmental Action Plan and their progress (targets and results for fiscal 2018; targets for fiscal 2019 and 2020, the final year) are summarized in the table below.

In fiscal 2018, compared to forecasts at the start of the period, due to negative factors such as lower sales volume in core products, we failed to achieve annual goals for a number of the items for which we set numerical goals.

Progress for items other than these, however, proceeded according to plan. For fiscal 2019, we have set goals based on predictions that negative factors will disappear; for example, volume is forecast to bounce back in core products. The NGK Group is working in concert to undertake environmental activities that will enable us to meet target goals for fiscal 2020, the final year of the Fourth Five-Year Environmental Action Plan.

Category	Item	KPI	FY2018			FY2019	FY2020	Take action in 11 of the 17 SDGs	
			Target	Result	Self-evaluation*	Target	Target		
Environmental/social contribution	 Environmental/social contribution through products	Develop and distribute products contributing to environmental protection	Sales growth (%) (consolidated)	Increase by 43% from FY2013	Increased by 44% from FY2013	○	Increase by 52% from FY2013	Increase by at least 60% from FY2013	
		Promote green procurement	Plan progress (%)	<ul style="list-style-type: none"> At least 99% of NGK's suppliers in Japan agree to comply with the CSR Procurement Guidelines Survey of overseas efforts methods 	<ul style="list-style-type: none"> 99.5% agreed (100% including suppliers who partially agreed) Unable to get useful information on overseas activities 	○	Maintain in Japan, survey overseas efforts methods (including situation with other companies)	Maintain in Japan, expand overseas	
	 Promotion of environmental communication	Contribute to local communities	Plan progress (%)	Send instructors to guest lecture programs, participate in local environmental protection activities	Sent instructors to elementary schools	○	Send instructors to guest lecture programs	Continually enhance actions partnering with communities	
		Raise environmental awareness	Plan progress (%)	<ul style="list-style-type: none"> Provide environmental education for employees Encourage participation in environmental events 	<ul style="list-style-type: none"> Provided training programs by job grade Installed "green curtains" 	○	Provide environmental education for employees, disseminate environmental policy, encourage participation in environmental events	Continually enhance environmental training and information disclosure	
	 Conservation of biodiversity	Promote actions based on biodiversity conservation guidelines	Plan progress (%)	Extend My Action Declaration project to Group companies in Japan	Extended My Action Declaration project to Group companies in Japan (approx. 1,300 people)	○	Continue to expand employee participation in My Action Declaration project	Expand and enhance content of Aichi Targets actions	
				 Prevention of global warming	Reduce CO ₂ emitted from manufacturing*5	Basic unit per net sales (consolidated)	Reduce by 14% from FY2013	Reduced by 13% from FY2013	
Reduce CO ₂ emitted from supply chains	Reduction rate against BAU (%)*2 (consolidated)	Reduce by at least 18% from FY2013	Reduced by 14% from FY2013		×	Reduce by 16% from FY2013	Reduce by 18% from FY2013 (upward revision from initial 15% target)		
Reduce CO ₂ emitted from supply chains	Basic unit per transport volume*3 (non-consolidated)	Reduce by 1% per year on five-year average*4	Increased by 3.4% per year on five-year average*4		×	Reduce by 1% per year on five-year average*4	Reduce by 1% per year on five-year average*4		
 Effective use of resources	Reduce discarded materials emitted from manufacturing*5	Basic unit per net sales (consolidated)	Reduce by 28% from FY2013	Reduced by 30% from FY2013	○	Reduce by 30% from FY2013	Reduce by 30% from FY2013		
		Reduction rate against BAU (%)*2 (consolidated)	Reduce by at least 23% from FY2013	Reduced by 20% from FY2013	×	Reduce by 22% from FY2013	Reduce by 23% from FY2013 (upward revision from initial 20% target)		
	Promote resource recycling	Recycling rate (Japan)	At least 99%	99.2%	○	At least 99%	Maintain at least 99%		
	Manage and respond to water resource risks	Plan progress (%)	Continue water risk surveys, give feedback on survey results to bases	Completion of water risk surveys	○	Give feedback on survey results	Strengthen actions by production bases for evaluating risks and streamlining water use		

Notes:

*1: Self-evaluation standards for achievement level: ○: Target achieved; ×: Target not achieved

*2: Reduction rate against BAU (business as usual) indicates the percentage rate of emissions reduction resulting from implemented actions compared to a case in which no improvement action was taken since fiscal 2013. By not incorporating the influence of foreign exchange movements and other factors, this indicator allows a direct grasp of the efforts by each site.

*3: NGK basic unit per transport volume expresses in metric ton-kilometers the amount of crude oil equivalent fuel used.

*4: Based on the computation criteria stipulated in the Act on the Rational Use of Energy.

*5: Covers all manufacturing sites of the NGK Group.

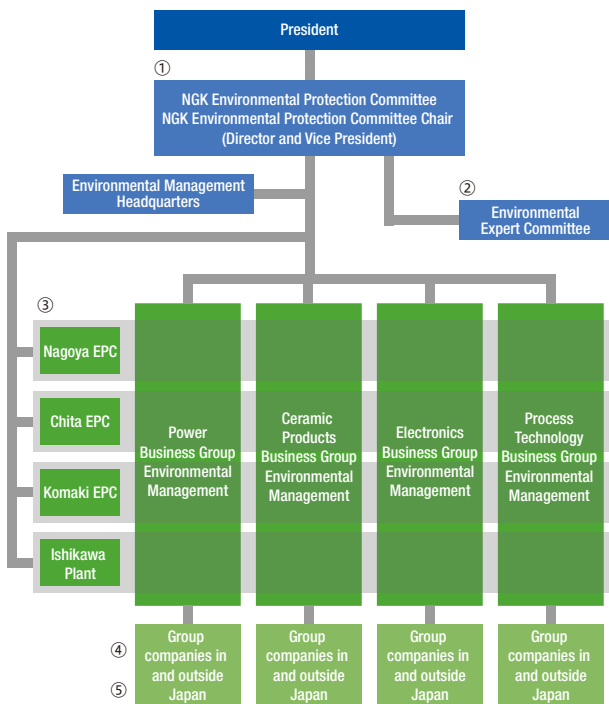
Environmental Management Frameworks and Environmental Management System

The NGK Group promotes environmental conservation activities in accordance with our Core Policy on the Environment through initiatives pertaining to environmental management frameworks and the Environmental Management System (EMS) implemented by global Group companies working in conjunction with one another.

Consolidated Environmental Management Promotion System

In addition to environmental management systems built independently at each site of NGK (Nagoya, Chita, Komaki, Ishikawa), we have established a consolidated management system to control environmental activities at all Group companies in and outside Japan under the leadership of each Business Group. The Five-Year Environmental Action Plan and the related annual plan are shared across the entire Group via the Business Groups to be incorporated into activity plans of each Group company.

To promote unified environmental management for the entire Group, annual liaison meetings are held for Group companies in Japan, while headquarters personnel visit Group companies outside Japan on a regular basis. Thus, we create interactive discussion and support opportunities to address issues facing each company.



① NGK Environmental Protection Committee

In principle, meets twice each year. Other meetings are held at the discretion of the chair.

Governing Structure

Chair	President makes decision in light of Executive Committee deliberations (As of April 2019, Director and Vice President)
Vice Chair	Appointed by NGK Environmental Protection Committee Chair (As of April 2019, General Manager of Environmental Management Dept.)
Members	Executive Vice President, Vice Presidents responsible for Headquarters Departments, Group Executives, General Managers, General Manager of Pollution Control at each site, General Manager of Environmental Management Dept., General Manager of Safety and Health Management, General Manager of Corporate Strategy Office, General Manager of Corporate Communications, General Manager of Human Resource Dept., General Manager of Group Compliance, General Manager of Finance & Accounting Dept., General Manager of Legal Dept., General Manager of General Affairs Dept., General Manager of Purchasing Dept., General Manager of Construction & Maintenance Dept., General Manager of Global Engineering Center, and others designated by the Committee Chair

② Environmental Expert Committee

In principle, meets twice each year. Meets before the NGK Environmental Protection Committee to review and discuss items to be reported to the committee.

Governing Structure

Expert Committee Chair	General Manager of Environmental Management Dept.
Vice Chair	General Manager of Construction & Maintenance Dept.
Members	General Manager of Business Planning Dept., persons in charge of promoting environmental activities in each division, Group Manager of Environmental Management Dept., others designated by the Expert Committee Chair

③ Environmental Committees at Each NGK Site (Nagoya Site, Chita Site, Komaki Site, Ishikawa Plant)

In principle, meets twice each year in each area. Thoroughly conveys matters determined by the NGK Environmental Protection Committee, and communicates and discusses issues and topics in each area (all four areas meet twice each year for a total of eight meetings).

④ Sharing Information with Group Companies in Japan

The Environmental Performance Questionnaire is used to conduct an annual survey into the status of compliance with environmental laws at each company. The annual liaison meeting for all Group companies that are involved in manufacturing is also held, and periodic on-site observations are carried out. This enables the Group-wide policy on environmental initiatives to be conveyed to manufacturing Group companies and each company's environmental management status and information on effective initiatives to be shared, thus promoting the unification of Group companies in Japan environmental conservation activities.

⑤ Sharing Information with Group Companies Outside Japan

The Environmental Performance Questionnaire is used to conduct an annual survey into the status of compliance with environmental laws at each company. Group companies that are involved in manufacturing receive regular audits to monitor management systems and conditions. The Group provides support for improving corporate governance structure and facilities as required.

History of NGK's Environmental Activities

April	1972	Environmental Protection Committee and Environmental Preservation Office (currently, Environmental Management Dep.) established
June	1992	Waste Countermeasures Commission established
March	1993	NGK's Voluntary Plan for Environmental Conservation established
December	1994	Chlorofluorocarbons (CFCs) and 1,1,1-trichloroethane abolished
February	1995	Internal environmental audit conducted
April	1996	NGK's Core Policy on the Environment established
December	1996	CO ₂ Countermeasures Commission established
March	1998	NGK's three production bases (Nagoya, Chita, and Komaki) simultaneously received ISO 14001 certification
March	1999	Environmental Report published
April	1999	Environmental accounting introduced
October	1999	Green Purchasing Commission established
November	1999	Environmental audits of Group companies in Japan started
February	2000	Environmental Partnership Organizing Club (EPOC) established and active participation therein begun
October	2000	Chemical Substances Safety Committee established; Chemical Substances Management System introduced
March	2001	1st Five-Year Environmental Action Plan established
April	2001	Compilation of environmental performance data for Group companies in Japan started
October	2001	Operating of Recycling Yard begun
January	2002	Compilation of environmental performance data for Group companies outside Japan started
April	2002	New "Green Management" three-year management plan instituted
April	2003	Moves made toward a full business group environmental management system; "Waste Countermeasures Commission" renamed "Recycling Promotion Commission" and "wastes" renamed "by-products."

March	2004	Three-year and long-term plans for reduction of CO ₂ emissions instituted
March	2005	Company-wide medium-term plan for the reduction in by-products established
April	2005	Guidelines for Environmental Action revised; Green Procurement Guidelines revised
October	2005	Third-party review of environmental performance begun
April	2006	2nd Five-Year Environmental Action Plan established
September	2006	Initiated environmental surveys of Group companies outside Japan
May	2007	Introduction of a consolidated goal for CO ₂ and by-products for Group companies in Japan
April	2008	Establishment of the Environmental Management Department
January	2009	Introduction of goals to reduce CO ₂ by-products, and chemical substances for Group companies outside Japan
January	2010	Expanded scope of goals to reduce CO ₂ by-products, and chemical substances for Group companies outside Japan
April	2011	Formulated the 3rd Five-Year Environmental Action Plan, "by-products" renamed "discarded materials."
March	2012	Three NGK sites (Nagoya, Chita, and Komaki) received integrated ISO 14001 certification
March	2013	The Ishikawa Plant received ISO 14001 certification (joint certification with three NGK sites)
April	2013	NGK established the Environmental Expert Committee as the authority handling matters related to CO ₂ discarded materials and other important environmental management items (created through the combination of the former CO ₂ Countermeasures and Recycling Promotion Commission)
February	2015	NAS Battery wins the Gold Prize at the 2015 Aichi Environmental Awards
April	2016	Formulated the 4th Five-Year Environmental Action Plan
January	2018	NGK's ISO 14001 certification upgraded to 2015 version

Environmental Management System (ISO 14001, etc.) Initiatives

The NGK Group encourages the acquisition of ISO 14001 or third-party certifications (such as Eco Stage 2 or Eco Action 21 in Japan) meeting this standard to systematically and continuously develop its environmental conservation activities in line with NGK's Core Policy on the Environment. Under this initiative, a total of 44 manufacturing sites, including those in Nagoya, Chita, Komaki, and Ishikawa, have been certified appropriately. We will work to expand the certification initiative within the Group, particularly targeting new plants. The Group will make effective use of these environmental management systems going forward with the intention of reinforcing its environmental management.

Certification of Environmental Management System As of March 2019

Categories		No. of manufacturing bases	No. of bases certified
NGK		4	4
Domestic Group	Power Business	6	3
	Ceramic Products Business	1	1
	Electronics Business	12	12
	Process Technology Business Group	4	4
Overseas Group	Power Business	4	3
	Ceramic Products Business	9	9
	Electronics Business	5	5
	Process Technology Business Group	4	3

Since fiscal 2016, the method of counting manufacturing bases that have EMSs was changed so that it counts the number of sites and the number of plants separately.

Environmental Audits

NGK conducts internal audits and external audits (renewal audits) of the environmental management system at the Nagoya, Chita, and Komaki sites, as well as the Ishikawa Plant. Group companies also conduct these same internal audits, and external reviews of the environmental management systems are conducted by external auditors at all Group companies.

In fiscal 2018, in the same way as with the previous year, there were no significant findings. In the event of a significant finding, the relevant division and Environmental Management Dept. work together to review and implement countermeasures, as well as inform environmental committees in each area in an attempt to horizontally deploy these measures.

Environmental Risk Management

At the NGK Group, each manufacturing site has individually established environmental management systems to prevent environmental pollution.

In fiscal 2018, the NGK headquarters conducted audits at 22 manufacturing bases in Japan and 11 overseas, with a focus on environmental risk control. Based on audit results, problems were remedied and support was provided for improvements as part of efforts to improve the management level for the entire Group.

Regulatory Compliance

NGK conducts monitoring and assessments as well as vigorous control of exhaust and wastewater produced from its sites, observing relevant regulations and environmental preservation-related and other agreements with control authorities. Additionally, we organize environmental management specialist seminars on a regular basis for all Group companies in Japan to keep responsible persons updated on related topics, thereby enhancing our capabilities to prevent environmental pollution.

Environmental Patrols and Emergency Response Drills

NGK implements environmental patrols in line with annual plans to prevent environmental pollution and conducts response drills based on emergency scenarios to minimize damage.

In fiscal 2018, environmental patrols were conducted at the Nagoya, Chita, and Komaki sites and the Ishikawa Plant to prevent atmosphere and water pollution, ensure the appropriate management of chemical substances, and suppress noise and vibrations. Response drills based on emergency scenarios were also conducted at these four areas. Going forward, NGK will continue to proactively engage in patrols and drills in an attempt to improve operational methods and mitigate environmental risks.

Activities Conducted in FY2018

		Atmosphere	Water	Noise and vibrations	Chemical substances
Nagoya	Environmental patrols	3	2	15	2
	Emergency response drills	4	2	—	2
Chita	Environmental patrols	1	2	1	2
	Emergency response drills	4	5	—	—
Komaki	Environmental patrols	1	1	1	1
	Emergency response drills	10	11	—	—
Ishikawa	Environmental patrols	2	2	2	2
	Emergency response drills	4	3	—	1

Note: "—" indicates emergency response drills were considered of low importance and not conducted.

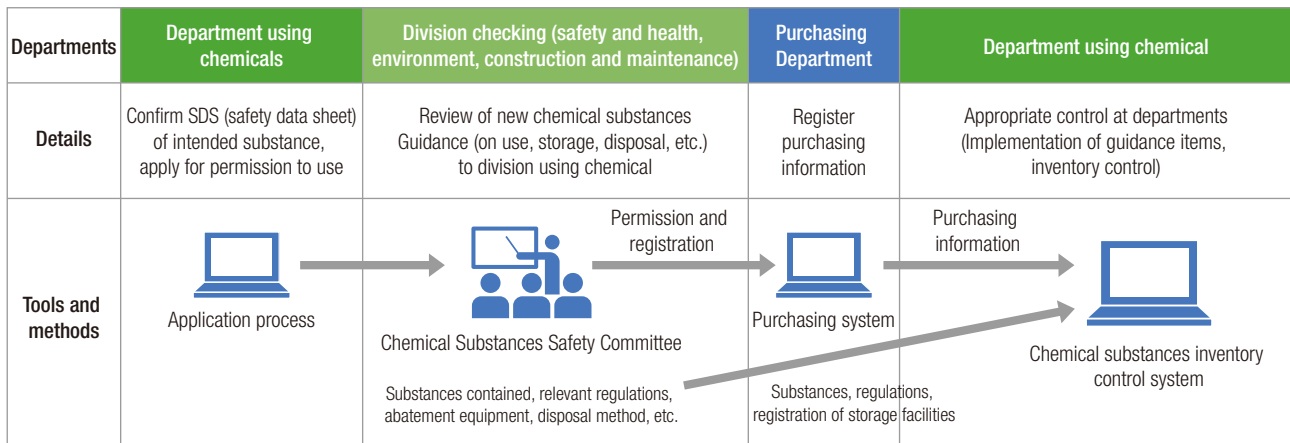
Chemical Management System

Since fiscal 2006, the NGK Group has been reducing the amounts used of organic solvents covered by PRTR and switching to substitute chemicals at its manufacturing bases in Japan. As a result of these efforts, in fiscal 2010 we reduced by 30% against fiscal 2005 the atmospheric emissions of these substances.

For NGK sites on a non-consolidated basis, strict checks are carried out when new substances come into use as part of efforts to maintain and raise the level of management. For example, before purchasing a new chemical substance, the Chemical Substances Safety Committee decides whether it should be used, then

confirms with, and provides guidance to, the departments that will use the chemical on important matters regarding the chemical's use and disposal. The departments using the new chemicals thus take the lead in proper management of the substances. Thanks to these efforts, atmospheric emissions of organic solvents and other PRTR-listed substances at NGK decreased in fiscal 2018 against fiscal 2005 by 59%. We are transferring this success to our main overseas manufacturing bases so that they lead to a lower environmental impact for the NGK Group as a whole.

Chemical Management Flowchart



Strengthening of Global Environmental Management

In accordance with the Guidelines for Environmental Action, the NGK Group horizontally deploys domestic environmental impact reduction initiatives in Group companies outside Japan while creating mechanisms to strictly comply with amendments to environmental laws and regulations to propel our global environmental management to the next level.

Mitigating Environmental Risks throughout the Group

All NGK Group companies in and outside Japan have completed acquisition of ISO 14001 or third-party certifications meeting this standard and implement environmental management in line with environmental management systems.

Certification upgrade to the 2015 version of ISO 14001 has been completed for the most part in fiscal 2018. The few companies that have not yet acquired certification for the environmental management system standard have launched the certification process.

NGK shares information regarding changes in domestic environmental laws and regulations with Group companies and has created a structure to ascertain the status of responses to these changes. Overseas, NGK headquarters is enhancing its ability to regularly ascertain the status of responses and management in terms of important legal and regulatory system revision information in the countries and regions where Group companies are located.

In fiscal 2018, the NGK headquarters conducted audits at 22 manufacturing bases in Japan and 11 overseas, with a focus on environmental risk. Based on audit results, problems were remedied and support was provided for improvements as part of continuing efforts to mitigate environmental risks throughout the Group.

Strengthening Environmental Management Linked to Business Planning

The NGK Group aims to build an environmental management system that can cope with changes in both our business plan and the state of the social environment.

Initiatives aimed at reducing environmental impact in accordance with business plans include conducting biannual forecast estimates and achievement evaluations in each business group, product line, and manufacturing base to determine which initiatives to pursue next.

These efforts include the establishment of the Environmental Expert Committee under the NGK Environmental Protection Committee as a company-wide decision-making body. The Environmental Expert Committee facilitates discussions among managers from planning and production divisions who formulate and promote actual business planning in each business division, strengthening the company-wide environmental management system. Going forward, we will continue to strengthen management integration with the aim of promoting environmental management that combines global environmental protection and corporate growth.

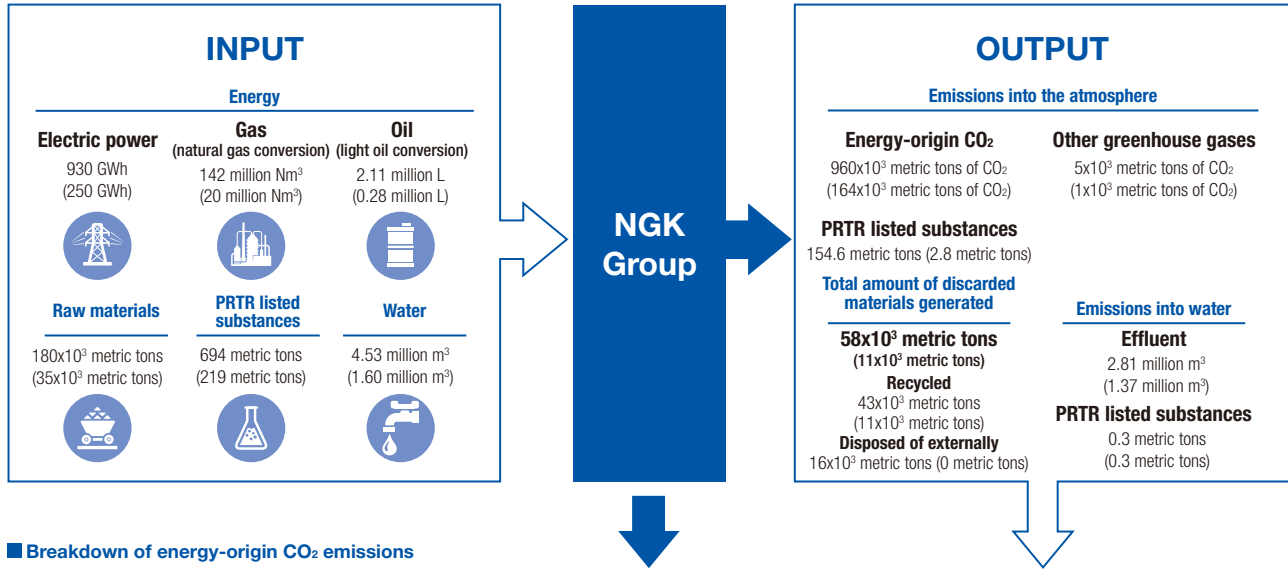
Overall Perspective of Environmental Impact

The diagram below shows aggregate inputs to and outputs from manufacturing operations of the entire NGK Group at all domestic and overseas sites in fiscal 2018. Inputs represent data for raw materials and energy etc. and outputs for manufactured products and services as

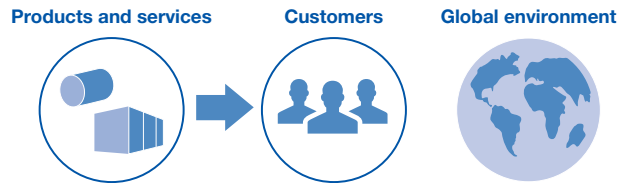
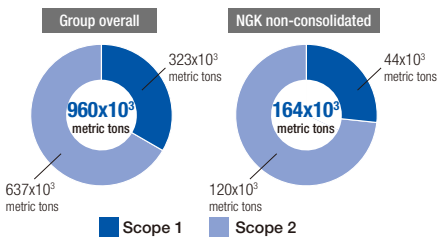
well as substances that are discharged into the atmosphere and into water.

Data up until fiscal 2017 covered only manufacturing bases, but from fiscal 2018 non-manufacturing bases were included in order to expand the disclosure of information.

NGK Group Material Balance (Input and Output)



Breakdown of energy-origin CO₂ emissions



Notes:

1. A new calculation method has been adopted for NGK CO₂ emissions on a non-consolidated basis. The calculation now uses the CO₂ conversion factor determined in the Enforcement Ordinance for the Act on Promotion of Global Warming Countermeasures (revised in May 2016).
2. Environmental performance values in this report have been rounded off for convenience; therefore the sum of individual values may not match the totals.
3. "Discarded materials" indicates the total amount of industrial waste and valuables.

Environmental Data Trends

Category	Sites covered	Unit	FY2016	FY2017	FY2018
GHG emissions (Scope 1)	Group	10 ³ metric tons	317	320	323
GHG emissions (Scope 2)	Group	10 ³ metric tons	562	612	637
GHG emissions (Scope 3) See page 29	Non-consolidated	10 ³ metric tons	—	877	1,047
Purchased goods and services	Non-consolidated	10 ³ metric tons	—	762	863
Capital goods	Non-consolidated	10 ³ metric tons	—	84	152
Fuel- and energy-related activities	Non-consolidated	10 ³ metric tons	—	16	18
Upstream transportation and distribution	Non-consolidated	10 ³ metric tons	—	11	8
Waste generated in operations	Non-consolidated	10 ³ metric tons	—	1	3
Business travel	Non-consolidated	10 ³ metric tons	—	1	1
Employee commuting	Non-consolidated	10 ³ metric tons	—	2	2
Upstream leased assets	Non-consolidated	10 ³ metric tons	—	0	0

Category	Sites covered	Unit	FY2016	FY2017	FY2018
Total water consumption	Group	Million m ³	4.09	4.32	4.53
VOC emission	Group	Metric tons	155.4	145.3	145.2
PRTR listed substance emission	Group	Metric tons	163.1	154.6	154.9
Total water discharge	Group	Million m ³	2.79	2.87	2.81
Total amount of discarded materials generated	Group	10 ³ metric tons	59	59	58
Percentage of manufacturing sites certified for environmental management system	Group	—	90%	88%	88%

Note: Covers manufacturing sites

INPUT

1. Energy

Electric power:

Consumption amount of electric power

Gas: Consumption volume of each type of fuel gas converted into natural gas volume = Σ (Consumption volume of each fuel gas \times Unit heating value of each fuel gas / Unit heating value of natural gas)

<Unit heating value of fuel gas>

Natural gas: 43.5 MJ/Nm³ City gas: 45.0 MJ/Nm³

LPG: 50.8 MJ/kg LNG: 54.6 MJ/kg

Oil: Consumption volume of each type of fuel converted into light oil volume = Σ (Consumption volume of each fuel \times Unit heating value of each fuel / Unit heating volume of light oil)

<Unit heating value of fuel>

Light oil: 37.7 MJ/L Fuel oil A: 39.1 MJ/L Kerosene: 36.7 MJ/L Gasoline: 34.6 MJ/L

2. Water

Total consumption volume of city water, industrial water, well water, and rainwater

3. PRTR Substances

Total amount handled of Japan's PRTR Type 1 listed substances

4. Raw materials

Total weight of raw materials used in product manufacturing

OUTPUT

5. Energy-origin CO₂ emission volume

Energy-origin CO₂ emission volume = Σ (Consumption of each energy \times CO₂ conversion factor of each energy)

<CO₂ conversion factor of energy>

(Unit of electric power factor: kgCO₂/kWh Unit of fuel factor: kgCO₂ / fuel unit)

Electric power

Japan: Emission coefficient for each electric utility in Japan (figure released on December 27, 2018 by Ministry of the Environment and the Ministry of Economy, Trade and Industry);

United States: 0.709; Belgium: 0.292; France: 0.061; Poland: 0.986; South Africa: 1.096; China: 0.983; Thailand: 0.687;

Indonesia: 0.790; Australia: 1.390; Mexico: 0.741; Malaysia: 0.543

Fuel Natural gas (Nm³): 2.22; City gas (NGK on a non-consolidated basis) (Nm³): 2.244;

City gas (except NGK on a non-consolidated basis) (Nm³): 2.23; LPG (kg): 3.00; LNG (kg): 2.70; Light oil (L): 2.58;

Fuel oil A (L): 2.71; Kerosene (L): 2.49; Gasoline (L): 2.32; Industrial steam (MJ): 0.06

6. Emission volume of other greenhouse gases

Emission volume of other greenhouse gases = Active mass \times Emission factor \times Global warming potential

<Global warming potential>

CO₂: 1; CH₄: 25; N₂O: 298; HFC: Differs by type; PFC: Differs by type; SF₆: 22800; NF₃: 17200

7. Effluent

Total amount of effluent excluding rainwater

8. PRTR listed substances

Emissions into water: Total emission amount of Japan's PRTR Type 1 listed substances into public waters

Emissions into atmosphere: Total emission amount of Japan's PRTR Type 1 listed substances into atmosphere

9. Total amount of discarded materials generated

Total amount of discarded materials generated = Externally disposed amount*¹ + Externally recycled amount

Recycled amount: Externally recycled amount = Paid disposal*² + Valuable amount (selling off)

*¹ Externally disposed amount: Direct disposal by landfill, or simple incineration

*² Paid disposal: Outsourcing disposal and paying for recycling

Preventing Global Warming

The NGK Group strives to reduce CO₂ emissions, a major cause of global warming, by setting and working toward achievement of emission reduction targets.

NGK is a member of the Japan Climate Leaders' Partnership (Japan-CLP), a business coalition in Japan that aims to create a low-carbon society through its engaged in decarbonizing business, trial business collaborations, policy creation and publicity activities, and cooperation with like-minded international organizations.

Management of Climate Change Risks

Action plans proposed by the NGK Environmental Protection Committee are deliberated on by the Board of Directors before being carried out under group environmental management. In fiscal 2019, the ESG Committee, made up of management and chaired by the President, was launched to discuss important tasks and strategies and create action plans related to ESG. The ESG Committee discusses the management of climate change risks.

Reducing CO₂ Emissions Associated with Manufacturing Activities

By creating and implementing annual improvement plans in line with the business plans of each of our manufacturing sites both within Japan and overseas, the NGK Group has been making steady progress toward achieving the CO₂ emissions reduction targets set under our Five-Year Action Plan.

In fiscal 2018, the start of production at a new factory and, the commencement of mass production of new products, and a temporary decrease in demand for main products combined to present difficulties in our efforts to reduce CO₂ emissions. As a result, we were unable to achieve the target for CO₂ emissions per unit of net sales that we set under the Five-Year Action Plan.

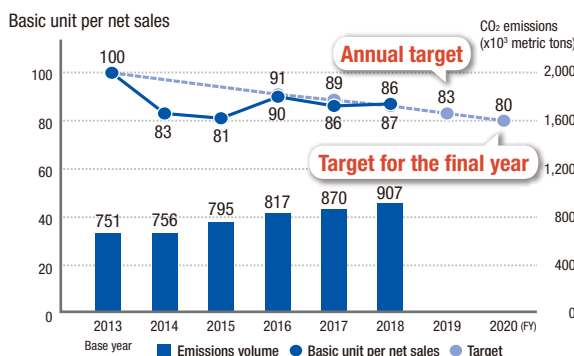
Furthermore, due to the effects of a drop in production volume, there was a worsening of the reduction rate against BAU, an indicator newly introduced under the Five-Year Action Plan to help visualize the effect of measures to reduce emissions.

For fiscal 2019, we forecast a recovery in demand for core products. We will intensify our efforts to achieve our reduction targets under the Five-Year Action Plan. To this end, we will carry out efforts such as a focus on boosting production efficiency at the new factory and in new product production, and full-fledged cost-saving by thoroughly implementing reduction measures at our bases.

Believing that preventing future global warming is one of our most important duties as a company, from a long-term perspective we have already started deliberating on how to further reduce CO₂ emissions after the end of our current Five-Year Action Plan. As part of this we are considering where we want to be as a company during the period between 2030 and 2050, and the policies that we will need to implement to realize that.

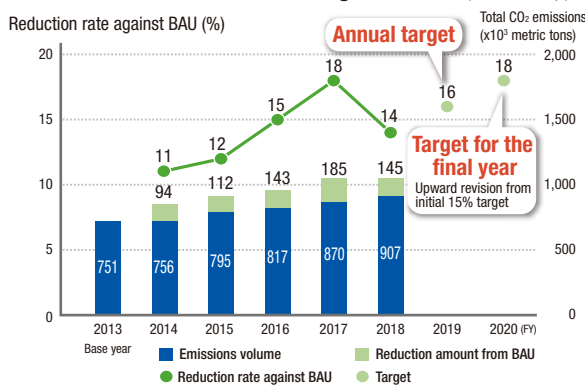
Note: In calculating CO₂ emissions under our environmental action plan, considering consistency with the target values from the past, we use the following CO₂ conversion factors, which differ from the figures in the section titled "Overall Perspective of Environmental Impact."
 CO₂ emission volume = Σ (Consumption of each energy × CO₂ conversion factor of each energy) <CO₂ conversion factor of energy>
 (Unit of electric power factor: kgCO₂/kWh Unit of fuel factor: kgCO₂ / fuel unit)
 Electric power: Japan: 0.42; United States: 0.709; Belgium: 0.292; France: 0.061; Poland: 0.986; South Africa: 1.096; China: 0.983; Thailand: 0.687; Indonesia: 0.790; Australia: 1.390; Mexico: 0.741; Malaysia: 0.543
 Fuel: Natural gas (Nm³): 2.02; City gas (Nm³): 2.29; LPG (kg): 3.007; LNG (kg): 2.70; Light oil (L): 2.64; Fuel oil A (L): 2.677; Kerosene (L): 2.49; Industrial steam (MJ): 0.06

CO₂ emissions / basic unit per net sales* (NGK Group)



*Basic unit per net sales calculated with the value in fiscal 2013 set at 100.

CO₂ emissions / reduction rate against BAU* (NGK Group)

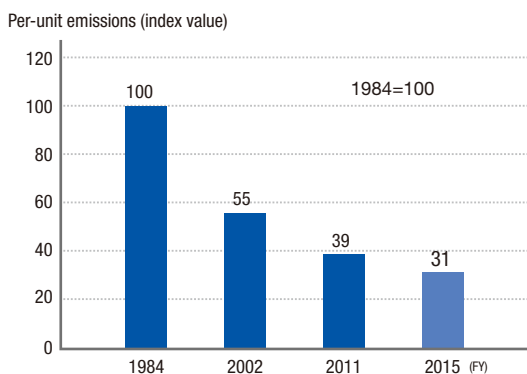


*Reduction rate against BAU: The percentage rate of emissions reduction resulting from implemented actions against a computed value for the hypothetical absence of the actions.

Adoption of Environmentally Friendly Production Processes

Through the introduction of highly efficient equipment and the promotion of the collection and use of exhaust heat and improved production efficiency, the NGK Group makes efforts to reduce environmental impacts resulting from production. Also, our Reformed Manufacturing Structures aimed at enhancing competitiveness significantly contribute to the realization of eco-processes. We will create further advanced eco-processes through our New/Reformed Manufacturing Structures.

Change in CO₂ emissions from continuous kilns by year of introduction



Note: Change in CO₂ emissions from continuous kilns, which constitute major production equipment

Examples of initiatives aimed at reducing CO₂ emissions

Category	Measures	Effects (fiscal 2018)
Highly efficient manufacturing processes	Main production efficiency initiatives at overseas sites <ul style="list-style-type: none"> • Introduction of innovative production processes • Facility improvements • Operational improvements 	CO ₂ reduction effect (13,700 metric tons) Japan: 5,000 metric tons Overseas: 8,700 metric tons
Group company energy-saving diagnostics	Promoted energy savings at overseas sites <ul style="list-style-type: none"> • An English version of the voluntary energy-saving guidelines and a best practice brochure created and distributed to overseas sites • Headquarters staff visited overseas sites and conducted activities with local employees 	Of which <ul style="list-style-type: none"> • Production process improvements Japan: 2,700 metric tons Overseas: 7,100 metric tons
General-purpose equipment energy-saving activities	Horizontally deployed main improvements <ul style="list-style-type: none"> • Replaced boilers with more efficient models • Eradicated air and steam leaks from plumbing • LED lighting • Renewed air-conditioning equipment and eliminated wasteful air conditioning 	<ul style="list-style-type: none"> • General-purpose equipment energy savings Japan: 2,300 metric tons Overseas: 1,600 metric tons

Measures to Reduce CO₂ Emissions and Effects

As we continue to expand overseas manufacturing, the NGK Group is particularly striving to raise manufacturing efficiency at our overseas sites in order to reduce the CO₂ emissions of the Group as a whole. We have made steady progress by introducing the innovative manufacturing processes and improvements to facilities and operations that we have implemented to date in Japan in our overseas manufacturing sites, as well as promoting energy-saving activities for general-purpose equipment.

In fiscal 2018, these initiatives achieved an annual CO₂ reduction effect of approximately 13,700 metric tons (a reduction rate of 1.5%), 60% or more of which was achieved by improvements carried out at our overseas sites.

Energy-Saving Activities for General-Purpose Equipment and Buildings

The NGK Group has been actively promoting energy-saving activities in relation to general-purpose equipment, such as lighting, air conditioners, boilers, and compressors. The headquarters plays a central role in this in terms of sharing know-how among different manufacturing locations, thereby achieving more efficient activities.

Whenever our buildings are built or altered, we ensure that large-scale energy-saving measures and ZEB (zero energy building) principles are incorporated.

(1) Headquarters Supporting Energy-Saving Activities at Overseas Manufacturing Sites

The headquarters Engineering Department has, over the years, sent personnel to overseas manufacturing sites to perform energy audits and, as necessary, help local staff develop and carry out effective energy-saving measures using the know-how gained from practices in Japan. These efforts have produced solid results at overseas companies, including NGK Ceramics Polska. (See “Global Warming Countermeasures Taken by Group Companies.”)

(2) Creating and Distributing a Printed Version of the Energy-Saving Brochure and Guidelines

We have created a printed version (Japanese, English) of our energy-saving guidelines and brochure of best practices, both of which were previously available only in

digital formats. Copies have been distributed to each manufacturing site in and outside of Japan to be kept handy at worksites for easy reference. This is expected to help enhance activities to reduce CO₂ emissions.



(3) Efforts to Conserve Energy within Buildings

Whenever there is the opportunity to build or renovate a building, we actively endeavor to utilize high-efficiency equipment and introduce renewable energy, and carefully consider each location so as to be able to effectively utilize any natural advantages, such as low-temperature waste heat from adjacent factories and natural ventilation/lighting, to achieve significant energy savings. The administration/welfare wing, which is currently under construction in Mizuho, Nagoya, is going to be a zero energy building (ZEB) that achieves a reduction in CO₂ emissions of 54% from the official standard. Our initiative to use pioneering CO₂ reduction technology for this building was recognized by the Japanese government, and the construction project was adopted as a Leading Sustainable Building Project (CO₂ Reduction) by the Ministry of Land, Infrastructure, Transport and Tourism.

We have many more construction/renovation projects lined up as part of our plans to reorganize corporate structure and update old buildings, all of which will include energy saving and ZEB measures.



Concept drawing for the administration/welfare wing in Mizuho (scheduled for completion in December 2019)

Global Warming Countermeasures Taken by Group Companies

NGK Stanger Pty. Ltd.

NGK Stanger collects and recycles gas-filled switches that are being disposed of by clients. These units contain sulfur hexafluoride (SF₆) for insulation purposes, and as it has a very high global warming potential, the company collects all SF₆ when disassembling the unit without allowing it to be released into the atmosphere. The total amount of SF₆ recovered in fiscal 2018 was approximately 570 kg, which is the equivalent of approximately 13,600 metric tons of CO₂.



NGK Ceramics Polska Sp. z o.o.

Since 2011, NGK Ceramics Polska has been focusing on improving processes for manufacturing SiC-based DPFs, its main product. Target areas include particularly energy-intensive calcination and drying processes, for which we have carried out various measures to reduce our CO₂ emissions. To further improve our performance, we will introduce new measures, including technologies provided by the Nagoya Site.



NGK Metals Corporation

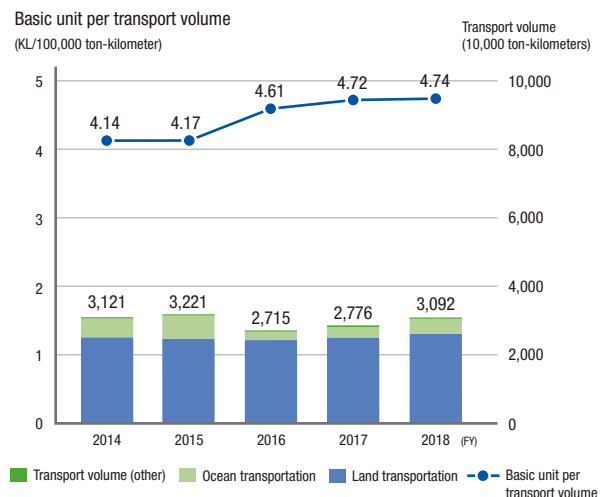
NGK Metals is reducing CO₂ emissions by updating control systems and improving the operation of production equipment. Among various efforts, a particularly distinctive effect resulted from automating the control units of the oil circulation system for rolling mills. The automation eliminated unnecessary around-the-clock operation, a measure taken to address inefficient activation/deactivation processes, as well as simplifying complex manual processing. This change helped reduce electric power consumption as well as CO₂ emissions.



Reduction of CO₂ from Logistics

NGK has worked to reduce CO₂ emissions from logistics, setting a target of reducing the basic unit per transport volume by 1% year-on-year on a five-year average, as required by the Energy Conservation Act. To achieve this target, we have implemented a number of measures, including improving loading efficiency and promoting a modal shift. In recent years, the basic unit per transport volume has shown a tendency to deteriorate due to a decline in the volume of goods transported by sea on account of a change in the product mix. In fiscal 2018, the five-year average deteriorated by 3.4% year-on-year.

Transport volume / basic unit per transport volume



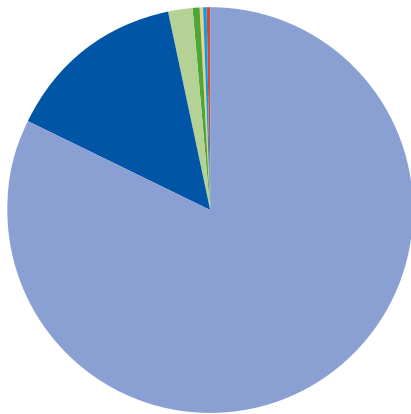
Reporting Scope 3 CO₂ Emissions

The NGK Group reports Scope 1 and 2 CO₂ emission data for the Group overall and for NGK independently in relation to logistics (for shipment from NGK). In addition to this, starting in fiscal 2017, NGK has been calculating Scope 3 emissions on a non-consolidated basis in response to emerging expectations for businesses to expand the relevant data reporting scope to include supply chain CO₂ emissions levels.

In fiscal 2018, NGK established calculation methods for all categories involving only NGK logistics (upstream from NGK) and obtained a total. As a result, NGK confirmed that the total volume of CO₂ emission from NGK

logistics was 1,047,000 metric tons, which was over six times more than the 164,000 metric tons of NGK in-house CO₂ emissions (sum of Scope 1 and 2), and that Category 1 (purchased goods and services) amounted to over 80% of total CO₂ emissions. NGK will continue to develop calculation methods that can ascertain CO₂ emission levels in relation to a greater range of items.

Please note that the calculation used for Scope 3 data was carried out in accordance with Basic Guidelines Regarding the Calculation of Greenhouse Gas Emissions through the Supply Chain (Ver. 2.2) (Ministry of the Environment; Ministry of Economy, Trade and Industry).



FY2018 Scope 3 Data
(NGK non-consolidated, upstream only)

Category	CO ₂ emissions (10 ³ metric tons)
Category 1: Purchased goods and services*	863
Category 2: Capital goods	152
Category 3: Fuel- and energy-related activities	18
Category 4: Upstream transportation and distribution	8
Category 5: Waste generated in operations	3
Category 6: Business travel	1
Category 7: Employee commuting	2
Category 8: Upstream leased assets	0
Total	1,047

*Resale items are included in Category 1.

Introduction of Green Power

As part of our corporate activities aimed at harmony with the environment, NGK began introducing “green power” (energy sources such as wind and solar power and biomass fuels) in 2002, earlier than any other company. The Green Power Certification System contract we signed with Japan Natural Energy Company Limited calls for them to generate two million kilowatt hours of biomass-generated electricity for us each year.

This accounts for about 60% of the power consumed annually at the NGK headquarters building, attaining a reduction effect of approximately 1,000 metric tons of CO₂ emissions per year, or the annual amount of CO₂ absorbed by approximately 71,000 cedar trees.



Promoting Effective Use of Resources

To boost yield from manufacturing process improvements, the NGK Group reuses in-process materials in an effort to curb discarded materials while also focusing efforts on recycling to reduce final disposal volumes to promote resource recycling.

Reducing Discarded Materials from Manufacturing Activities

In the same way as for CO₂, the NGK Group works to suppress the generation of waste (discarded materials) by formulating and managing annual improvement plans with the aim of achieving the waste reduction targets contained in the Five-Year Plan.

In fiscal 2018, as with CO₂, there were numerous factors that hampered waste reduction, such as the start of a new plant and the start of mass production of new products. However, the basic unit per net sales steadily improved over the previous year, so were able to achieve our fiscal year target as well as the target under our Five-Year Plan ahead of schedule. This was thanks to the continuing improvement activities of our manufacturing divisions, such as improving the material utilization rate and production yield, and recycling within each process. Meanwhile, the reduction rate against BAU, which indicates the rate of improvement in the basic unit per production volume from the fiscal 2013 level, was 20%, thus falling short of the fiscal year target of 23%. This was due to a temporary drop in demand for some of the products for which we had achieved dramatic improvements. For fiscal 2019, we forecast volume to rebound to the levels of two years ago.

In fiscal 2019, we will accelerate and advance efforts up to now with the goal of further improvement.

Promoting Resource Recycling

At the NGK Group, we promote resource recycling initiatives, pursuing rigorous sorting and separating practices and seeking out new methods of recycling.

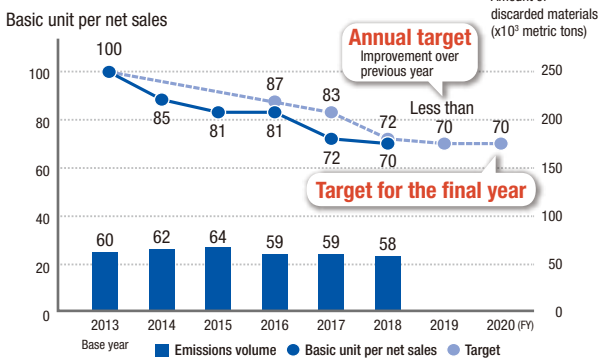
In fiscal 2017, we started sharing information with our production sites in Japan regarding waste recycling methods and companies that can process such waste. This has allowed us to choose highly reliable waste processing contractors and continue to improve waste recycling efficiency. Through such ongoing efforts, we have managed to sustain a domestic recycling rate of 99% or higher since fiscal 2013, which is the target set under the Five-Year Plan.

Meanwhile, at our Group companies outside Japan, where the situation varies according to country and region, suitable targets are set taking into account circumstances specific to each location. The recycling rate for our 22 manufacturing Group companies overseas has remained at over 90%, based on calculations that exclude three companies that generate non-recyclable waste.

Group Company Outside Japan Implementation Examples

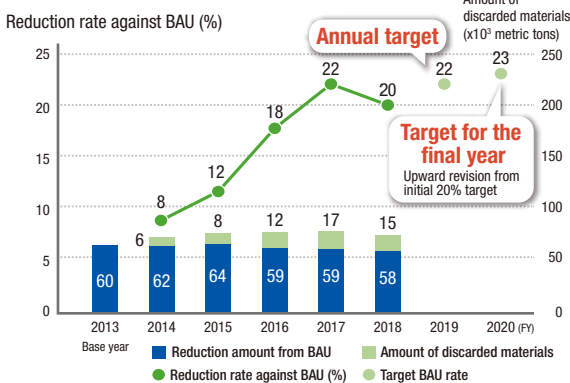
At Group companies outside Japan, waste material separation management is strictly enforced. Waste separation rules are posted where waste materials are stocked and color-coordinated containers are provided for each category of waste to avoid confusion.

Amount of discarded materials generated / basic unit per net sales* (All NGK Group manufacturing sites)



*Basic unit per net sales calculated with the value in fiscal 2013 set at 100.

Discarded materials / reduction rate against BAU* (All NGK Group manufacturing sites)



*Reduction rate against BAU: The percentage rate of emissions reduction resulting from implemented actions against a computed value for the hypothetical absence of the actions.



NGK Ceramics Europe



NGK Ceramics USA

Risk Management of Water Resources and Response

The NGK Group recognizes the management of water resources as an important issue for the company in achieving a sustainable society, and promotes relevant initiatives as described below.

Water Risk Evaluation

To ascertain water supply risks for each of our production facilities in and outside Japan, the NGK Group performed a simplified internal survey to assess water shortage risks based on the water supply capacity of rivers in the respective regions. For production facilities located in areas where there is a risk of water shortages, particularly overseas, we commissioned a third party to conduct a comprehensive survey. As part of that survey, in addition to the water supply capacity of rivers, factors such as groundwater, seasonal fluctuations in water supply capacity, and the holding capacity of dams are evaluated and used to create water supply/demand forecasts. The risk of water-related disasters (flooding, landslides) and water quality deterioration (public health, ecosystem) is also analyzed as part of a comprehensive risk assessment.

These efforts allow us to determine water risk at all overseas manufacturing sites, information that we share among all of our sites.

Although no serious water-related risks have been identified to date at any of our facilities, we stay abreast of regulatory trends and we strive to make more efficient use of water.

Water Usage Guidelines

NGK created guidelines (an implementation status checklist) aimed at appropriate water usage and, in fiscal 2015, launched inspections to ascertain the efficiency of water usage at all manufacturing sites in and outside of Japan. Going forward, we will enhance these guidelines through internal and external case studies while encouraging efforts at each location to strengthen the operational structure against a future tight water supply.

Cooperation with Suppliers

Believing that it is important to address issues related to water resources throughout the supply chain, the NGK Group asks its suppliers to practice water resource-related risk management and efficient water usage in accordance with the CSR Procurement Guidelines. In fiscal 2018, 99.5% of companies in NGK's domestic supply chain agreed to our request.

Promoting Efficient Water Use at Group Companies

NGK Ceramics Mexico, S. de R.L. de C.V.

We strive to use precious water resources as appropriately and efficiently as possible, including the recycling of water used inside plants, at Group companies located in highly water-stressed regions.

For example, at NGK Ceramics Mexico, manufacturing process waste water is filtered using reverse osmosis membranes and the recycled water is reused as coolant and boiler water or sprinkled on vegetation.



Filtration device using reverse osmosis membranes

Protecting Biodiversity

In the NGK Group, we view the challenge of protecting biodiversity as an integral part of achieving a sustainable society, and towards that end we are undertaking the following activities.

Activities for Achieving the Aichi Targets

The NGK Group has been pushing forward with activities pursuant to the Aichi Targets (international goals for biodiversity) agreed upon at the 10th Meeting of the Conference of the Parties to the Convention on Biological Diversity (COP 10).

Since fiscal 2016 under the current Five-Year Plan, we have done biodiversity surveys of company-owned sites, taken part in the Ministry of the Environment's "My Action Declaration" initiative, and worked in unison with our suppliers.

Promoting Participation in the "My Action Declaration" Initiative

In fiscal 2017, as a way of raising awareness among employees, we began promoting participation in the "My Action Declaration" initiative led by the Japan Business Federation and the Ministry of the Environment. This project aims to have by 2020 a million people make a declaration to take action to conserve biodiversity.

Declarations have been received from a total of 4,800 employees who promised to take a personal interest in and work to protect the biodiversity around them. We have also expanded this initiative throughout NGK Group companies in Japan and so far a cumulative total of 6,200 group employees have made the declaration (as of March 2019).



My Action Declaration card

Aichi Targets		NGK Activities
Target 1 Spread awareness	People are aware of the value of biodiversity and actions to be taken to conserve it.	Employee environmental education, next-generation education, cooperation with suppliers, promoting participation in My Action Declaration initiative , encouraging employees to participate in volunteer activities
Target 4 Sustainable production and consumption	Stakeholders at all levels have taken steps to achieve sustainable production and consumption.	Expanding sales of products contributing to environmental protection, CO ₂ reduction, effective use of resources, cooperation with suppliers
Target 5 Inhibit loss of all natural habitats	The rate of loss of all natural habitats, including forests, is at least halved, and degradation and fragmentation is significantly reduced.	Voluntary employee participation in forestation and other environmental conservation activities, biodiversity survey/appropriate control of company-owned site
Target 8 Control pollution by chemical substances, etc.	Pollution from use of chemicals, including fertilizers and agrichemicals, has been brought to levels that are not detrimental to the ecosystem.	Chemical substance management, management of exhaust and wastewater, expanding sales of products that prevent air pollution, cooperation with suppliers
Target 9 Alien species	Invasive alien species are controlled or eradicated.	Biodiversity survey/appropriate control of company-owned site
Target 11 Conserve protected areas	At least 17% of terrestrial and inland water areas and 10% of coastal and marine areas are placed under appropriate conservation management.	Voluntary employee participation in forestation and other environmental conservation activities
Target 14 Ecosystem services	Ecosystems that provide essential natural services are restored and safeguarded.	Voluntary employee participation in forestation and other environmental conservation activities, biodiversity survey/appropriate control of company-owned site

Notes:

- Source: "Guidelines for Action by the E&E Industries concerning Biodiversity Conservation" (The Biodiversity Working Group, The 4 Electrical and Electronic Industry Associations)
- NGK activities commenced in fiscal 2016 are marked in red.

Cooperation with Suppliers

We have added to the CSR Procurement Guidelines items pertaining to water resource-related initiatives and biodiversity conservation initiatives. We have won the agreement of 95% of our suppliers in Japan to comply with the expanded Guidelines.

Biodiversity Survey of Company-Owned Site

At an NGK employee welfare facility located on the outskirts of Nagoya City, we carry out periodic summer and winter surveys of birds, plants, and insects. Among the diversity of wildlife confirmed, no alien species that require urgent action has been found, meaning that biodiversity is being adequately maintained. The results of the surveys are displayed on panels at the facility in order to raise awareness of the area's biodiversity among facility users.



Biodiversity survey

Environmental Education and Communication

In accordance with the Guidelines for Environmental Action under NGK's Core Policy on the Environment, we conduct ongoing environmental education and awareness activities aimed at increasing employee environmental awareness. Our aim is to deepen the understanding of environmental problems among each employee to inculcate an awareness of environmental conservation activities.

We also conduct environmental events and provide information to a wide range of stakeholders, including on-site classes at elementary schools, to increase environmental awareness.

Participating in Local Environmental Education

Offering Guest Lectures at Elementary Schools and Children's Centers

NGK sends instructors to participate in lectures and workshops for young people that are hosted each year by EPOC (Environmental Partnership Organizing Club)*. In fiscal 2018, the program was held at Misaki Elementary School in Toyoake, Aichi Prefecture, where our instructors offered a class on water resources and usage, in which children could experience how soil can purify water.

So far, a cumulative total of 2,300 people have participated in environmental education programs with which NGK is affiliated.



Employee Volunteers Teaching Parent-Child Insect Classes

Every summer at Tsuruma Park in Nagoya's Showa Ward, NGK employees and Executive Vice President Kanie teach Summer Break Insect Observation classes for children and their parents (hosted by the Nagoya City Greenery Association), explaining the various names and ecosystems of insects living in the park.

This annual event has been attended by a cumulative total of 600 people since 2007.



Sharing Information with Other Companies

The EPOC* subcommittee chaired by NGK organizes seminars and field trips several times a year under the theme of corporate environmental management (low carbon, resource recycling, biodiversity, water resources, environment-related laws, etc.) and sends out information to members.



*EPOC (Environmental Partnership Organizing Club): A voluntary organization consisting mainly of companies in the Chubu region of Japan, which was established in 2000. Its purpose is to spread information regarding the environment with the aim of building a recycling-oriented sustainable society. NGK has been involved in the planning and management of this organization since its establishment. EPOC currently has approximately 270 members.

Raising Environmental Awareness

Environmental Education inside the Company

We conduct position-based training related to environmental management systems to familiarize employees with the aims and content of NGK's environmental policies. We also provide specialized environmental training courses for personnel who will be directly involved in environmental management, as well as special environmental training for the entire workforce.

For our special environmental training in fiscal 2018, we invited a representative from Daikin Industries, Ltd. to give a lecture on how the company strives to reduce environmental impact at its sites and through its products, the connection between SDGs and business, and a long-term environmental vision.

Promoting the Acquisition of Qualifications

To continue conducting environmental conservation activities in compliance with laws and regulations, we make an effort to develop and increase the skills of legally qualified personnel. We provide support in each department for the acquisition of environment-related legal qualifications targeting managers engaged in pollution prevention required for the management of each site.

We systematically educate Qualified Energy Managers in the Engineering Department, and Special Controlled Industrial Waste Managers and others involved in waste-related activities in the Environmental Management Department and other business divisions.

Qualifications Acquired as of March 31, 2019 (NGK)

Pollution Control Managers			Qualified Energy Managers	Special Controlled Industrial Waste Managers	Waste Disposal Facility Technical Managers
Air	Water	Noise/Vibration			
79	94	27	20	16	4

Support for Acquisition of Eco Test Certification

With the aim of ensuring that each employee acquires a strong environmental awareness and a wide range of knowledge with respect to the environment, NGK encourages employees sitting the Eco Test* by lending them reference materials and subsidizing test-related expenses.

To date, a total of 808 people—more than 19% of all NGK employees—have passed the test. In fiscal 2018 alone, 90 employees passed the test.

*The Eco Test is an environmental and social certification test administered by the Tokyo Chamber of Commerce and Industry focused on a wide-range of environmental issues.

Year	2014	2015	2016	2017	2018
No. of successful examinees	94	94	120	125	90

NGK Eco Point System

NGK promotes its Eco Point System in an effort to contribute to regional environmental improvement. Employees earn points for environmental behavior conducted at work and in the home, a portion of which is converted into cash and donated to local government-managed funds (environmental funds).

In addition to the company's three sites in Nagoya, Komaki and Chita and the Ishikawa Plant, the system was newly introduced to the Tokyo Main Office and Osaka Branch and sales offices in fiscal 2016.

Donation of NGK Eco Points

The NGK Eco Points earned by individual employees through their engagement in environmental activities are aggregated on an annual basis for each site (Nagoya, Chita, Komaki, Ishikawa), and top scorers are commended every year. For earned points, employees select from two options: exchange for eco goods or donate to local funds. The number of employees choosing donation is growing every year, indicating increasing environmental awareness.



Hiroyuki Mizuno, director of the Nagoya Municipal Environmental Affairs Bureau (left); Keisuke Kono, last year's leading Eco Point earner for the Nagoya district (center, Sensor Purchasing); Kunikazu Hamaguchi, environmental manager at the Nagoya Site

Creating Products That Contribute to the Environment

The NGK Group considers contributing to society through business activities to be one of its most important missions. For nearly a century since its founding, NGK has made use of accumulated technologies to develop and provide products and technologies that reduce burdens on the global environment.

Development and Distribution of Products Contributing to Environmental Protection

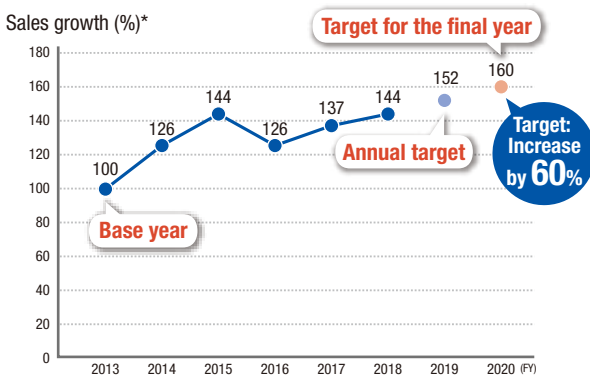
Under our fourth Five-Year Environmental Action Plan initiated in fiscal 2016, NGK has set a goal of increasing sales of products that contribute to environmental protection by 60% compared with fiscal 2013 (and maintaining the sales percentage for products contributing to environmental protection at over 50% of all products).

In fiscal 2018, sales of products that contribute to environmental protection increased by 44% over fiscal 2013, exceeding the fiscal year goal of 43%. In fiscal 2019, we are working toward this target by increasing sales of and spreading the use of these products. There are a total of nine products that contribute to environmental protection: seven from previous and two—gallium nitride (GaN) wafers and micro-lenses for ultraviolet LEDs—registered in June 2019. We are currently developing other products that contribute to environmental protection; for example, zinc rechargeable batteries, fuel cells, and CO₂ separation membranes.

Definition of NGK products that contribute to environmental protection:

- 1) Certified or awarded by third-party institutions
- 2) Control or reduce impact on the Earth's environment
- 3) Reduce impact on the local environment

Sales growth for products contributing to environmental protection (NGK Group)



*Figures are indexed with fiscal 2013 set at 100.

NGK Group Products Contributing to Environmental Protection

HONEYCERAM®

HONEYCERAM is a ceramic substrate for catalytic converters to purify harmful contents in the exhaust of automobiles. It carries a catalyst that detoxifies harmful substances by chemical reaction, and its honeycomb structure provides a greater contact surface area for the exhaust and thus gives better purifying performance.

Since the launch of mass production in 1976, over 1.5 billion units have been shipped of this essential ceramic product for purifying exhaust. NGK's HONEYCERAM eliminates a total of four million metric tons of NOx per annum*¹, equivalent to double the annual NOx emissions in Japan*².

*1 Assumption based on installation of exhaust gas system in new cars that are not equipped with such systems

*2 Source: OECD Environmental Statistics (2012)

NOx elimination: **4** million metric tons annually

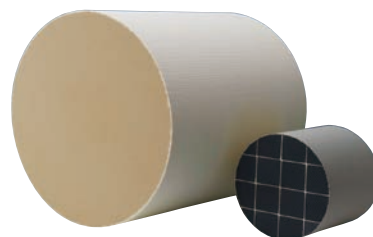


Diesel Particulate Filters (DPF)

The DPF is a porous ceramic filter used worldwide in the exhaust systems of diesel vehicles. With a pore structure, the filter ensures particulate matter (PM) is captured to purify the exhaust emitted from diesel vehicles. NGK is the only company to produce two types of DPFs based on both cordierite and silicon carbide. NGK's ceramics technologies support further developments for diesel vehicles.

The honeycomb structure, where the inlet and outlet of the through-holes are alternately sealed, enables the thin ceramic walls to efficiently capture PM while exhaust passes through.

Eliminates up to **99** % of PM

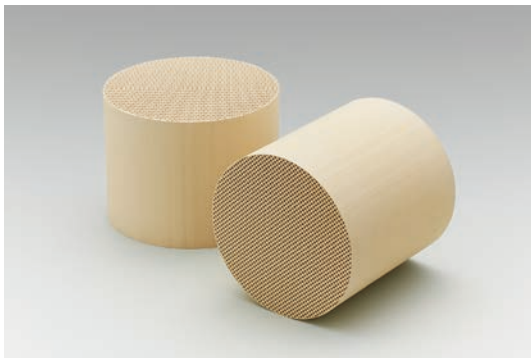


Gasoline Particulate Filters (GPF)

GPFs are ceramic filters that remove particulate matter (PM) from the exhaust of gasoline-powered vehicles.

We developed this filter based on diesel particulate filter (DPF) technology, and succeeded in producing a GPF that can achieve high performance (captures more PM) and low pressure loss (lower fuel costs and higher output) at the same time through the use of our proprietary micropore creation and control technologies. We were the first to commercialize a GPF in 2012, and commenced mass production in January 2016 at one of our subsidiaries.

As automobile emission regulations throughout the world become stricter, we expect that demand for GPFs will increase. To respond to this demand increase, we are boosting production capacity.



In-vehicle high-precision NOx Sensors

NGK developed the world's first in-vehicle sensor to measure concentrations of nitrogen oxides (NOx) in exhaust in real time with high precision. Specifically, the sensor is capable of measuring NOx concentration at the parts per million (ppm) level and can thus detect even very small amounts of the noxious substance. The sensor supports precise control of the exhaust purification device used in diesel vehicles, which leads to a reduction in NOx emissions and helps to promote the use of clean diesel vehicles.



NAS® Batteries

One of the most frequent uses of the NAS battery is for stabilizing the supply of renewable energy. While electricity from renewable sources, such as wind and solar power, is clean and, in principle, unlimited, its major limitation is that its output is affected by weather conditions, resulting in supply instability. The NAS battery resolves this limitation by storing excess renewable energy when generation exceeds demand, and supplying the stored energy to the grid when renewable output is low or demand is high. NAS systems enable the global growth of stable renewable energy.



NGK was the world's first manufacturer to commercialize the NAS battery megawatt-class storage system. Featuring a large capacity, high energy density, and long life, the battery can support the reliable, long-term stable supply of electricity. Also, the NAS system allows for a more compact housing compared with conventional lead-acid batteries.

**NAS systems are the world's most popular
grid-scale battery storage**

**Installed at over 200 locations worldwide with a
560 MW/4000 MWh capacity**

(As of June 2019)

Low-Level Radioactive Waste Treatment Systems

NGK has developed a wide range of systems to safely treat low-level radioactive waste generated from nuclear facilities and has supplied these systems to nuclear power stations and related facilities across Japan. The systems are developed utilizing NGK's proprietary treatment technology and high-performance filter-based dust collection technology.

We undertake a variety of engineering projects including design, manufacturing and site construction, and also provide a long-term maintenance service to deliver stable and high-level radioactive decontamination. NGK thereby provides essential support for the safe and stable operation of nuclear facilities.

In addition, we focus on the development of new systems for treating various types of radwaste expected to be generated from the decommissioning and dismantling of aging nuclear reactors.

Importance of Treating Radioactive Waste

When treating and disposing of waste generated in radiation-controlled areas, including nuclear power stations, it is critically important to prevent the spread of radioactivity via the release of radioactive matter. This requires special treatment and disposal methods that differ from those for general waste.



Wavelength Control Drying Systems

Our wavelength control drying system uses a proprietary heater unit developed in-house to promote the evaporation of solvents.

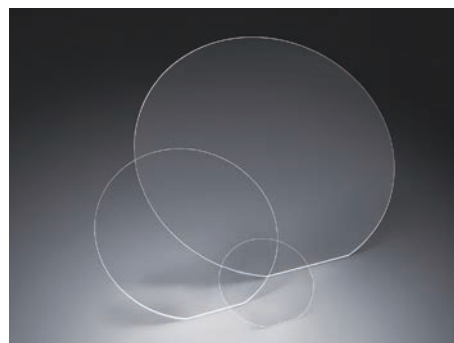
This system uses specific infrared frequencies to effectively facilitate evaporation, shortening drying time to approximately $\frac{1}{2}$ to $\frac{1}{3}$ of that required for conventional drying methods using heat, and reducing power consumption by 30 to 50%. It is also possible to suppress binder segregation, which is an expression of variations in concentration that occur due to drying of the soluble component in films during drying, by 30 to 40% (in-house binder segregation study).



Gallium Nitride (GaN) Wafers

This low-defect density gallium nitride (GaN) wafer uses NGK's original crystal growth method covering the entire wafer. With the Minamata Convention on Mercury going into effect in August 2017, there is expected to be high demand for high-output, high-efficiency semiconductor lasers using GaN wafers as a substitute for ultra-high-pressure mercury lamps. It was against this background that we released the gallium nitride (GaN) wafer in April 2018. It is expected to see use in light sources for projectors, stadium lighting, car headlamps, and other products.

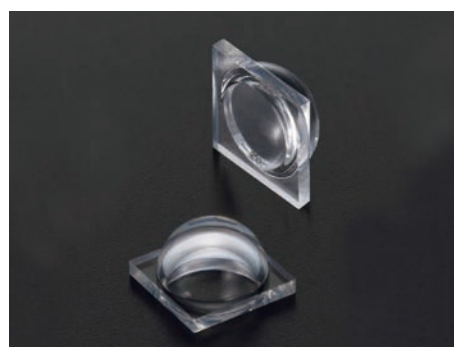
The gallium nitride (GaN) wafer was also developed with a view to application in high-frequency devices for next-generation 5G wireless base stations, and power devices key to realizing a low-carbon society such as inverters for electric vehicles and power conversion equipment for photovoltaic power.



Gallium nitride (GaN) wafers

Micro-Lenses for Ultraviolet LEDs

Like the gallium nitride (GaN) wafer, micro-lenses for UV LEDs are made from transparent quartz glass developed by NGK and are used in UV LEDs instead of mercury lamps. Mercury lamps are currently used in light sources used in applications such as the sterilization of water and air. Factors such as the Minamata Convention going into effect are increasing the likelihood that mercury lamps will be banned and sparking interest in UV LEDs that do not use mercury. NGK's micro-lenses for UV LEDs are characterized by a cavity that holds a UV LED chip, a feature that improves UV LED efficiency and lowers costs.

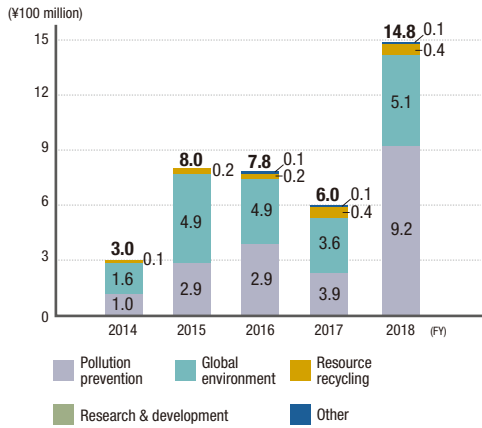


Micro-lenses for ultraviolet LEDs

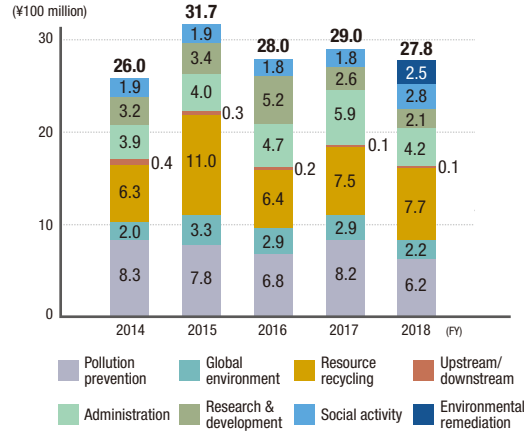
Environmental Accounting

As an important index of environmental management, NGK conducts environmental accounting and announces the results. In addition to announcing environmental conservation costs (capital investment, expenses), economic benefits, and cost effectiveness, information on the environmental efficiency of CO₂ and discarded materials has been added since fiscal 2007.

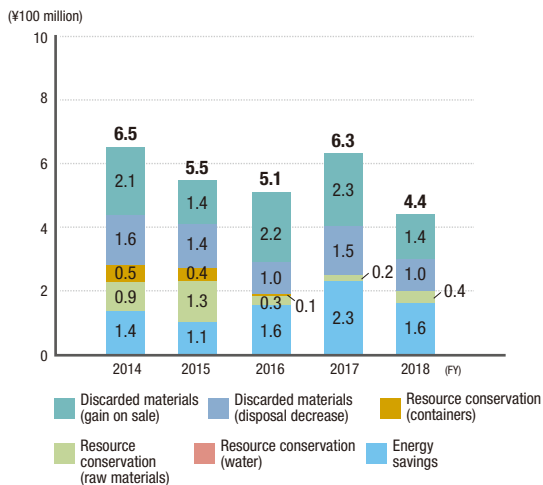
Capital investment (NGK and Group companies in Japan)



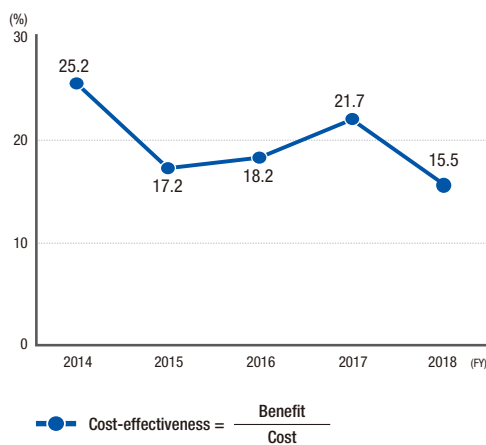
Expenditures (NGK and Group companies in Japan)



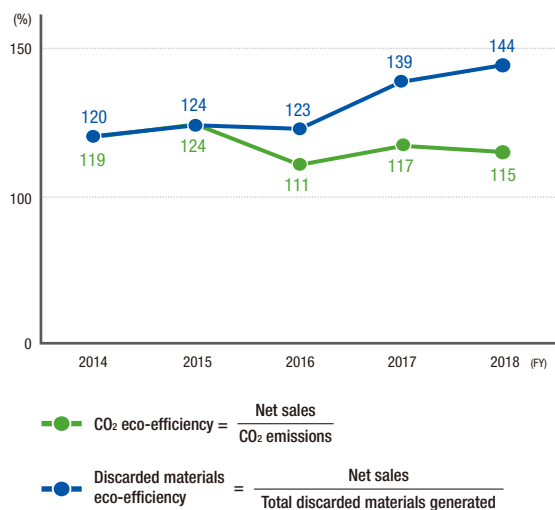
Economic benefits (NGK and Group companies in Japan)



Cost-effectiveness (NGK and Group companies in Japan)



Environmental efficiency (consolidated)



Note: The above charts do not include data for NGK Electronics Devices, Inc. and other manufacturing subsidiaries from fiscal 2014 to fiscal 2015.

Social

NGK Sustainability Data Book 2019

Social

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Communication with Stakeholders

The NGK Group promotes shareholder-oriented management emphasizing capital efficiency across the entire Group and strives to improve corporate value with the goal of realizing sustainable growth.

Basic Approach

NGK is engaged in the maximization of corporate value through two-way communication with shareholders and investors, including efforts to provide accurate and timely explanations regarding management conditions and policies.

NGK makes best efforts to promote constructive dialogue through sincere responses to requests for interviews with shareholders and investors, questions raised at General Meeting of Shareholders, and inquiries sent through NGK's website. These responses are facilitated under the guidance of the directors in charge of the Finance & Accounting Department, which work in close cooperation with the Corporate Strategy Office, the Corporate Communications Department, and the Legal Department when necessary.

NGK also places importance on direct dialogue with

institutional investors, conducting biannual earnings presentations and overseas IR road shows led by senior management.

As for dialogue with individual investors, we had a booth at the Nomura IR Asset Management Fair 2019, sponsored by Nomura Investor Relations Co., Ltd.

The details of these dialogues are regularly reported to the Board of Directors. This management feedback is used to improve management efficiency and transparency.

Shareholder and investor dialogues are conducted with the objective of increasing corporate value and capital efficiency, as well as promoting sustainable growth. The disclosure of material information not already publicly available within the context of these dialogues constitutes damage to the equality between shareholders. In principle, NGK does not disclose unannounced material information.

Disclosure and Explanation of Corporate Information

- We will promptly and accurately disclose any information required by society.
- We will listen to stakeholder opinions with the utmost sincerity and take responsibility to respond to them.

Reference
URL

NGK Group Code of Conduct

<https://www.ngk-insulators.com/en/sustainability/guideline/>

Targeted Stakeholder and Response Policies

In addition to promoting understanding regarding the NGK Group among customers, suppliers, shareholders, investors, regional communities, governments, international organizations, universities, research institutes, and employees, we are continuously improving our activities and initiatives through dialogue with all of our stakeholders.

In fiscal 2018, we again conducted the CSR Monitor Survey, which targets general consumers.

As a result of this survey, it was revealed that among the NGK Group's CSR activities, general consumers are interested in global environmental conservation.

We will incorporate the opinions gathered through the surveys into our CSR reporting for next year and beyond, as well as our future CSR activities.



Connection with Customers

To earn and maintain the trust of customers, we engage in the creation of new value through the provision of products and services realizing global environmental conservation and social safety and peace of mind from a long-term and global perspective.

Connection with Suppliers

With a basic policy centered on the three principles of openness and fairness, partnership, and relationship with society, the NGK Group is engaged in fair, free, and transparent business transactions with the procurement partners in our supply chain. We also established a supplier helpline to provide unwavering support for important inquiries in an effort to build and maintain fair supplier relationships.

Connection with Shareholders and Investors

The NGK Group aims to meet expectations for enhanced corporate value through dialogues and efforts to disclose information pertaining to management, finance, products, and services in a timely and appropriate manner.

Connection with Regional Communities

We proactively engage in social contribution activities in response to community needs with the intent of becoming a corporate citizen trusted by society with concern for social issues in all countries and regions where we do business.

Connection with Governments and International Organizations

We proactively participate in international initiatives and other activities in order to realize mutual cooperation as key actors seeking to resolve social problems.

Connection with Universities and Research Institutes

Through research and educational activities based on industry-academia collaboration, we have been pushing forward with the development of scientific technologies and other technologies that will contribute to solving social problems.

Connection with Employees

The NGK Group strives to create a safe and comfortable workplace environment with respect for employee humanity. We also support the growth of human resources and fair treatment enabling each employee to maximize their skills.

Implementation Status of Stakeholder Engagement

Stakeholders	Objectives	Communication methods	Frequency
Customers (including general consumers)	Enhance customer services Quality improvement	Official website	Regularly
		Contact desk	Regularly
		Participation in exhibitions	A few times a year
		Open innovation	Regularly
Suppliers	Realize fair, free and transparent transactions Exchange information with suppliers Establish better supply chain	Financial results presentations	Once a year
		Supplier helpline	Regularly
		Individual visits to suppliers in Japan and overseas	Regularly
Shareholders and Investors	Enhance corporate value	General Meeting of Shareholders	Once a year
		Information sessions	Twice a year each in Japan and overseas
		Individual visits and interviews	Regularly
		Participation in IR events	Once a year
		Countermeasures for socially responsible investment (SRI)	Regularly
		Official website	Regularly
Regional Communities	Contribute to regional communities as a trusted corporate citizen	Collaborative activities with NPOs, etc.	Regularly
		Volunteer activities by employees	Regularly
		Social contribution activities in cooperation with labor unions	Regularly
		Invitation to plant tours and events	Regularly
Governments and International Organizations	Promote initiatives to solve social problems	Participation in international initiatives	Regularly
Universities and Research Institutes	Develop scientific technologies Develop technologies that will contribute to solving social problems	Joint research	Regularly
Employees	Respect the human rights of employees Develop safe and comfortable workplace environments Conduct surveys on workplace environment and employee satisfaction Inculcate corporate philosophy and policies	Company newsletter	Once a month
		Global MIZUHO English-version company newsletter	Twice a year
		Video news	Twice a month
		Intranet	Regularly
		Labor-Management Advisory Board meetings / Regular Labor-Management Council meetings	Once a year / Twice a year
		Survey on workplace vitality	Once in two years
		CRS (Corporate Risk Survey)	Once a year
		Expectation survey on CSR promotion actions	Once a year
		Helpline	Regularly
		Hotline	Regularly

Human Rights Initiatives

Having established respect for human rights in its Code of Conduct, the NGK Group uses its intranet, which is available to all domestic Group company employees, to explain and disseminate the United Nations “Universal Declaration of Human Rights”^{*1} and “Guiding Principles on Business and Human Rights.”^{*2} Taking the signing of the UN Global Compact in 2015 as an opportunity, NGK has been actively spreading awareness for protecting human rights by holding seminars on the subject.

*1: Adopted on December 10, 1948 at the Third United Nations General Assembly Session, this declaration expresses the rights to which all human beings in all nations are inherently entitled (General Assembly Resolution 217 (III)). The formal name is the Universal Declaration of Human Rights.

*2: Based on the “Report on Human Rights and Transnational Corporations and Other Business Issues” by John Ruggie, UN Secretary-General’s Special Representative for Business and Human Rights (at that time).

Reference Page

Compliance Education

P100

WE SUPPORT



The UN Global Compact is a global framework for realizing sustainable growth through companies and organizations acting as good members of society. Participating corporations support ten principles in the areas of human rights, labor, the environment, and anti-corruption required in the practice of corporate activities.

The Ten Principles of the UN Global Compact

Human Rights

- Principle 1: Businesses should support and respect the protection of internationally proclaimed human rights; and
- Principle 2: make sure that they are not complicit in human rights abuses.

Labor

- Principle 3: Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining;
- Principle 4: the elimination of all forms of forced and compulsory labor;
- Principle 5: the effective abolition of child labor; and
- Principle 6: the elimination of discrimination in respect of employment and occupation.

Environment

- Principle 7: Businesses should support a precautionary approach to environmental challenges;
- Principle 8: undertake initiatives to promote greater environmental responsibility; and
- Principle 9: encourage the development and diffusion of environmentally friendly technologies.

Anti-Corruption

- Principle 10: Businesses should work against corruption in all its forms, including extortion and bribery.

Eliminating Harassment

When hiring or promoting personnel to key positions, NGK provides these personnel with harassment elimination training.

Harassment Elimination Training

Item	FY2014	FY2015	FY2016	FY2017	FY2018
Sessions held	6	11	6	5	5
No. of participants	203	277	326	350	464

Commencing Human Rights Due Diligence

The NGK Group has commenced human rights due diligence across the Group as of fiscal 2016.

In reference to the RBA (Responsible Business Alliance) Code of Conduct and the United Nations’ Guiding Principles on Business and Human Rights, the NGK Group set specific survey items with support from external consultants. We embarked on the activities involving Group companies in Japan in November 2016. In fiscal 2017, we began gradually expanding the scope of activities to our headquarters and overseas Group companies.

Note: Human rights due diligence are steps that a company must take to recognize and deal with negative impacts on human rights. It involves the formulation of policies related to human rights, assessment of impacts of corporate activities on human rights, and follow-up and disclosure of performance results.

Customers

Guided by the Corporate Philosophy, which puts customers first, the NGK Group considers the provision of products and services that contribute to a better social environment to be one of its most important missions in an effort to create quality from the customer's perspective.

Basic Approach

The NGK Group engages in the creation of quality from the customer's perspective by defining Quality Objectives each year in accordance with the Quality Policy based on the NGK Group Code of Conduct.

Initiatives for Fiscal 2019

In fiscal 2018, we undertook product quality initiatives focused on expanding the existing QRE-P* operations protocol to both established and new products. In addition, with the launch of a quality compliance program focused on maintaining and improving the operational systems that are in place in each workplace to ensure that promises made to customers are fulfilled, we expanded the scope of our quality-related activities to include work quality.

For fiscal 2019, we have developed quality guidelines to clearly specify essential quality assurance items at every stage of new product development for product quality. And for work quality, we are working to reorient management's thinking from a quality management perspective and to strengthen the mechanisms in place to incorporate contractual content into operations.

Our Quality Objective for fiscal 2019 is a continuation from fiscal 2018, as we recognize that insufficient progress has been achieved on the initiatives begun in fiscal 2018.

*QRE-P (Quality Risk Elimination Process): An operational protocol intended to more effectively eliminate quality-related risks at every stage when bringing products to market, from product planning to mass production.

Quality Policy

NGK is dedicated to quality and committed to providing valuable products and services that are trusted by our customers and respected by society.

Quality Objectives 2019

Thorough examination and strengthening of the Quality Assurance System.

Quality Activity System

The NGK quality activity system consists of a company-wide system, led by the Quality Committee Chair, and business division internal activity systems, led by the heads of each business division. In terms of company-wide activities, the Quality Committee was established to function as a deliberative body assisting the Quality Committee Chair, while business division internal activity systems were put in place for each business line, creating appropriate quality systems for each. Quality assurance, quality control, quality improvements, and quality education activities are promoted by the acquisition of ISO 9001 or IATF 16949 certification.

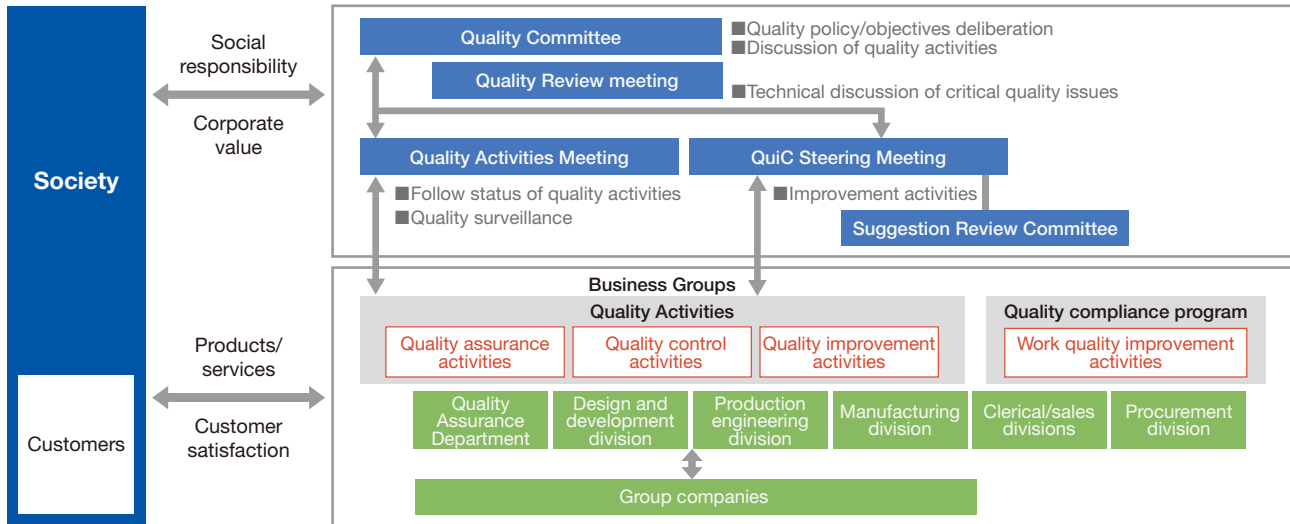
In the event of a serious quality-related issue, the CSR Committee Chair and the Quality Committee Chair will discuss and cooperate in making a response. Technical issues are discussed at Quality Review meetings, as necessary, to plan countermeasures, and the Quality Committee Chair supervises execution of the measures at

the responsible division. In the case of an external issue, the CSR Committee Chair will direct necessary arrangements to take an appropriate response without delay.

Starting in fiscal 2018, we have sought to address non-conformity issues in the delivery tests by codifying standardized rules that will further strengthen our quality compliance. In addition we have expanded quality-focused activities for “work quality” as well as “product quality”.

In terms of organizational structure, we have made revisions to the members of the Quality Committee to ensure that quality activities are directly overseen by senior management, and, with regard to the Power Business Group and its compliance issue, we have assigned customer quality assurance duties to a quality assurance department, which is independent of the Business Group carrying out the business activities.

Quality Activity System



Acquisition of ISO 9001 or IATF 16949 Certification

	FY2014	FY2015	FY2016	FY2017	FY2018
Percentage of ISO 9001 certified sites (% Group)	100	100	100	97	97

Note: In FY2017 and 2018, NGK Ceramics (Thailand) Co., Ltd. was preparing to obtain certification.

■ Enhancing the Elimination of Quality Risks Company-Wide

NGK Group Quality Activity Rules

The NGK Group promotes restructuring of its quality activities to respond more precisely to increasing and diversifying quality demands from customers in different target markets. In particular, quality activity rules have been formulated to enhance the elimination of quality risks in the market; we are promoting the establishment and improved effectiveness of the rules.

Seeking Greater Effectiveness from Quality Activities and Innovation in Operational Procedures

Since fiscal 2017, we have been promoting Quality Risk Elimination Process (QRE-P) activities throughout the NGK Group. Through these activities, we can identify procedural innovations in product realization in order to eliminate risk while improving quality. In fiscal 2018, we revised regulations in around 40% of our divisions. In fiscal 2019, we will continue to revise the regulations in around 75% of our divisions.

A lot of practice and experience are necessary to reach the level of understanding required to be in charge. Staff members deepen their understanding by working closely with the person in charge.

Four Rules for Quality Activities

○ Quality confirmation rule

Establish milestones, from development to start of production, and confirm conformance with six quality levels when production processes change.

○ DR* function strengthening rule

Register DR plans with quality risks of medium or high level as important DR subjects with participation of company-wide DR reviewers. The Quality Management Department head holds company-wide DRs for cases with particularly high risk level.

○ Quality monitoring rule

Monitor and share information company-wide with respect to quality status changes or problems concerning products or markets. Manufacturing defects and customer complaints are shared company-wide every month through reports to the Quality Management Department, and the appropriateness of countermeasures is discussed.

○ Handling major customer complaints rule

In the event of a serious customer complaint, including a potential complaint, the situation is promptly reported to the Quality Committee Chair to formulate company-wide countermeasures.

* Design Review

Activities to Strengthen DR Functions

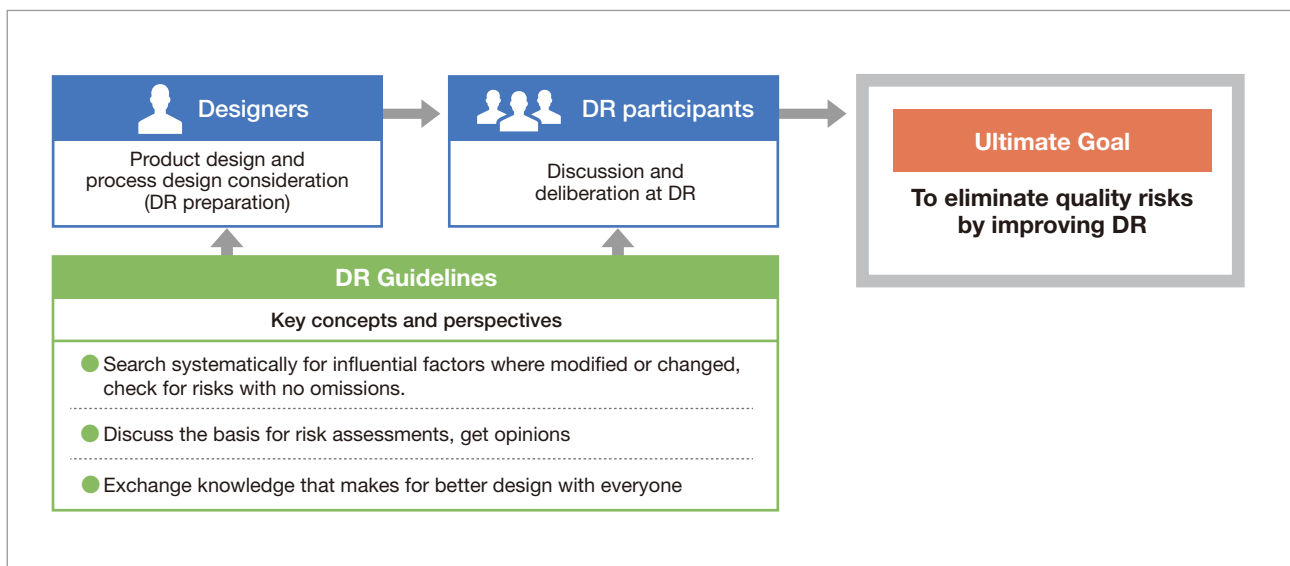
The increasing and diversifying quality demands from customers call for the integration of knowledge among various members, not only from the design division but also from the manufacturing and production engineering divisions, throughout the development process. For this reason, the NGK Group considers the Design Review (DR) to be the most critical activity. DRs are conducted when development milestones are reached or when production processes change. Critical DRs are conducted by reviewers from throughout the company to support the elimination of quality risks.

The DR Guidelines were created to promote DR discussions and to thoroughly eliminate quality risks. We are constantly enhancing the effectiveness of DRs through efforts to spread these guidelines company-wide,

including awareness and review of each DR. In addition, each division is required to prepare and utilize the DR evaluation indicators to check by themselves of their level and to encourage their improvements.

Furthermore, NGK organizes a company-wide DR (quality review meeting) for quality issues that are difficult to solve by one division. At this meeting, relevant engineers and experts from across the company discuss broad aspects of issues related to the reliability and safety of products.

We are also deploying the above-mentioned QRE-P approach to facilitate improvement of design level at the pre-DR period as well as to ensure the more effective utilization of organizational knowledge and experience from DRs.



Quality Activities at Overseas Production Bases

From their inception, overseas production bases have created quality systems appropriate to their situations and acquired ISO 9001 or IATF 16949 certification.

Monthly reports from each base regarding customer complaints and the status of manufacturing quality are discussed at quality activity meetings, enabling the entire NGK Group to evaluate the quality status in a timely manner. Moreover, quality activity rules and annual quality objectives are distributed in an attempt to develop and enhance quality activities.

Strengthening Quality Education at Overseas Production Bases

In fiscal 2018, six improvement activities award recipients took part in overseas training as well as ran quality-related education seminars at two overseas bases of NGK Group companies in the U.S.

The aim of the seminars was to foster a greater push for improvement activities by discussing their significance, introducing the activity ideas of the award recipients, and encouraging a greater emphasis on production costs and losses. In conjunction with this, the local staff and the award recipients partook in awareness-raising training focused on plant-related problems. Later, the award recipients offered ideas for addressing these problems by introducing improvement activities in Japan.



QuiC Activities to Improve Quality with Full Employee Participation

Since 2003, the NGK Group has held QuiC (Quality up innovation Challenge) quality improvement activities in which all employees participate. These activities consist of quality improvement activities by small groups or individuals and suggestions that strive to enhance the quality of production; best practices are then shared by the entire NGK Group. Every July, NGK holds a company-wide contest at its headquarters to highlight examples of outstanding improvement activities with the intent of horizontal expansion throughout the company.

In fiscal 2018, the contest was held twice: once in May and once in July. Continuing from last year, the manufacturing and non-manufacturing divisions' activities were once again held in May and July 2019.

The non-manufacturing divisions' contest began with a keynote speech in the morning, followed in the afternoon by the introduction of eight non-manufacturing practices, including those from two Group companies in Japan. For the manufacturing divisions' contest, 13 practices were introduced, including those from three overseas plants and five Group companies in Japan. Around 600 NGK Group employees and executives attended the competition.

FY2018 suggestion activity participation rate	
Manufacturing divisions	100%
Non-manufacturing divisions	92%
Number of suggestions	Approx. 28,000



At the non-manufacturing divisions' contest held in May, the President's Special Award was presented to the General Affairs Department at Komaki, who worked to continue the summer festival and reduce the burden on the staff.



At manufacturing divisions' contest held in July, ACIn won the Grand Prize for maximizing equipment capacity through a rigorous process of trial and error.

Offering Award Recipients an Opportunity to Visit Overseas Sites

From the end of October to the beginning of November, four fiscal 2017 QuiC Outstanding Proposal Commendation recipients and two fiscal 2018 QuiC Grand Prize recipients visited NGK-Locke Polymer Insulators (NLPI) and NGK Metals (NMC), two Group companies in the U.S. At the company, visitors and local employees conducted improvement point (awareness) training and shared opinions on best practices.

This program is organized to help participants better understand the importance of the mother factory in Japan, as well as to encourage self-development. It is also expected to inspire the local workers to appreciate the importance of quality improvement, thus accelerating the overall efforts of the Group.

In December, another six fiscal 2017 Outstanding Proposal Commendation recipients and 10 fiscal 2018 Excellence Award and Special Award recipients visited Okinawa to attend a nationwide QC Circle Conference and participate in discussion sessions.



Training at NGK Metals

Expanding Improvement Activities to Overseas Production Bases

The NGK Group is working to expand improvement activities to overseas production bases.

During the overseas training period in 2018, we visited two Group companies in the U.S. and implemented the following.

- Introducing NGK's quality improvement activities, significance, manufacturing cost, and concept of manufacturing costs and losses to local staff
- Observed the factory with local staff, discussed how to identify problems and solve them
- Presented examples of improvement in Japan

Strengthening Quality-Related Education

In order to facilitate greater product value and to better meet the expectations of customers, the NGK Group provides employees with quality-related education focused on acquiring skills that can be used to incorporate specific customer needs into new products.

NGK, along with other Group companies, is continuously working to improve quality management system (QMS) training, which incorporates real-life topics into practical training and the promotion of operational improvement measures.

Main Practical Programs Strengthened in FY2018

Program name	Number of days and participants	Objective
QCI	20 days; 49 (manufacturing staff in their third year)	Learn statistical quality control methods and apply them to solving problems relevant to the individual participant's operational duties
Quality Basic II	50 days; 60 (engineering staff in their third year) and 1 from Group company	Learn basic quality control methods and apply them to solving real-life problems
Quality Control Training for Group Companies	3 days; 10 from Akechi Insulators 10 days; 19 from Soshin Electric (Nagano and Miyazaki)	QCI level practical training implemented by NGK
Learning from Failure and Methods of Creation	9.5 days (including 7-day exercises and 1-day presentation); 119 (total number of participants)	Improve analytical skills and the ability to identify broader applications so that failures can be actively capitalized upon as resources for future potential
Quality Basic III-3	Design reviews: 0.5 day (twice); 49 (total number of participants)	Develop an understanding of in-house initiatives to functionally strengthen DR, and engage in classroom and hands-on learning on effective risk elimination procedures
Prevention Training	Product liability seminar: 0.5 day; 17	Develop an understanding of product liability laws, including how such laws have been applied in specific B2B cases, in order to heighten participants' mindfulness of quality-related risks
	Seminar to increase awareness: 1 day; 14	Understand basic approaches to preventive action and recurrence prevention; understand risk examination procedures
	Issue examination and discussion: 3 days; 25 (total number of participants)	Perform risk examination using actual quality issues faced Preventive Action by course participants
QMS Training	Lecture on ISO/IATF standards: 1 day; 98 and 11 from Group company	Develop an understanding of the intent and key requirements of standards
	Internal quality auditor training: 2 days; 81 and 10 from Group company	Cultivate and certify internal quality auditors
	Strengthening internal auditing capability: 1 day; 116 and 5 from Group company	Strengthening QMS, quality compliance, and process auditing ability

Points of Strengthening Quality-Related Education

- **Quality Basic III-3 Design Review**
Design review simulation training run by outside instructors was held after basic instruction in effective risk elimination procedures. This training helped participants reinforce what they have learned while fostering greater attentiveness to design checkpoints as well as overlooked areas in risk elimination.
- **Prevention**
In response to concerns about insufficient attentiveness to quality-related risks in the market, a seminar on product liability laws, which included real-life B2B examples, was held in conjunction with the Legal Department.

53 Employees Pass Self-Maintenance Expert Test (Grade 1: 30 Employees, Grade 2: 23 Employees)

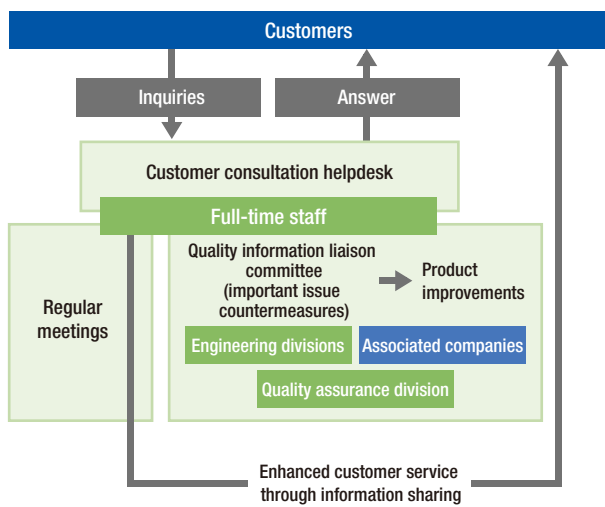
Fifty-three manufacturing division and engineering center employees who are engaged in NGK's voluntary maintenance activities passed the Self-Maintenance Expert Test (Japan Institute of Plant Maintenance) conducted in October (Grade 1: 30 employees, Grade 2: 23 employees). This qualification is given to those who possess a broad range of knowledge and skills necessary concerning quality management, safety, and machinery maintenance, and are certified to have the ability of planning and implementing voluntary maintenance activities and giving instruction. NGK will continue to encourage employees to acquire such qualifications in order to improve quality management capabilities at manufacturing sites.

System for Making Use of Customer Feedback in Management

Establishment of a Customer Consultation Helpdesk

As the top industrial ceramics manufacturer in the industry, NGK makes use of its accumulated technologies to manufacture and sell C1 home-use water purifiers and promotes the creation of mechanisms for reflecting customer feedback.

We set up an C1 inquiry service for customers to create a mechanism for reflecting customer feedback in our products and services. During fiscal 2018, we received around 7,000 inquiries via phone and e-mail on various issues, including installation methods, product performance, requests for catalogs, and requests for repair and installation.



Customer Cards

We also respond to various customer feedback provided on customer cards sent from the customers who purchased the C1.

Information on the customer card is added to a list and then used to improve the service we provide for our customers, such as notifying them when it is time to replace the cartridge.



Employees

The NGK Group implements a human resource system which enables every employee to perform at their full potential under fair treatment.

Basic Approach

In the NGK Group Code of Conduct revised in January 2019, our relationship with employees is based on the idea of “Respect for Human Rights” and “Provide a Safe and Enjoyable Work Environment” and defined as follows.

Respect for Human Rights

- We will strictly comply with international standards of human rights and respect the diversity of all people.
 - We will respect human rights and undertake business activities without the use of forced labor or child labor.
 - We will respect the individuality and independence of each employee and not engage in discrimination on the basis of race, citizenship, gender, age, religion, belief, existence of handicaps, sexual diversity or any other aspect.
 - We will prevent the occurrence of harassment in the workplace and take prompt and appropriate action in the case where it occurs.

Provide a Safe and Enjoyable Work Environment

- We will provide a safe and enjoyable work environment that is comfortable for everyone to work in for all.
 - We will strictly comply with laws and regulations of each country and region relating to labor, safety and sanitation.
 - We will aim to harmonize work and life, and support a variety of working styles.
 - We will build up a relationship of trust through sincere debate and discussion with employees.
 - We will give educational opportunities to employees and provide opportunities to stretch their motivation and abilities.

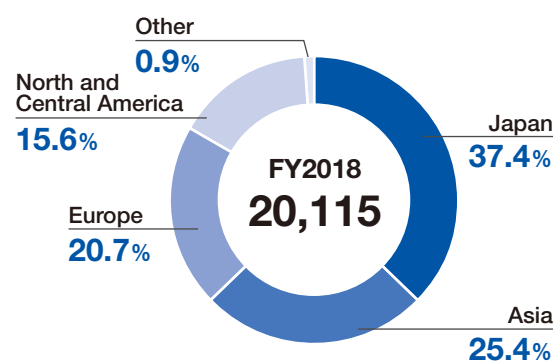
Basic Information on Employees

Number of NGK Group Employees

	Number of employees
FY2014	16,217
FY2015	16,657
FY2016	17,517
FY2017	18,783
FY2018	20,115

Note: Regular employees (includes employees from outside companies who have been temporarily assigned to the NGK Group, but excludes employees from the NGK Group who have been temporarily assigned to outside companies)

Composition of NGK Group Employee Composition by Region



NGK Employee Status in FY2018



Note: Regular employees (excludes employees from NGK Group companies or outside companies who have been temporarily assigned to NGK, but includes employees from NGK who have been temporarily assigned to NGK Group companies or outside companies)



Average age	39.0 years old (Men: 38.1 / Women: 39.1)
Average length of service	14.1 years (Men: 14.1 years / Women: 15.1 years)
Average salary	7,888,094 yen

Turnover Ratio (No. of persons)

	FY2018
Turnover ratio	1.42% (62)
Men	1.21% (46)
Women	2.92% (16)

Voluntary Turnover Ratio (No. of persons)

	FY2018
Voluntary turnover ratio	1.15% (55)
Men	0.96% (40)
Women	2.52% (15)

Number of New Hires Remaining at the Company (3 years)

	New graduate hires in 2016	Retention in 2019	Retention rate
Total	158	150	94.9%
Men	127	124	97.6%
Women	31	26	83.9%

Revision of the Human Resource System for General Employees

In April 2017, NGK revised its human resource system for general employees to enable all employees, from the young to the experienced, to work with enjoyment and fulfillment. As NGK develops its businesses globally and promotes the creation of new products and businesses, it is essential to motivate young and mid-level employees who will take on future key roles and encourage them to demonstrate their full potential. The revised system aims to build the environment that makes these possible.

Key Points of the Revised System

Qualifications	<ul style="list-style-type: none"> Developing a mechanism whereby all employees can challenge to qualify for a higher job grade. Clarifying the definition of each qualification.
Evaluation	<ul style="list-style-type: none"> Shifting from age-based evaluation to effort- and result based evaluation.
Retirement at age 65	<ul style="list-style-type: none"> Maintaining the same level of salary after age 60.

NGK Definition of General Employees

Group S: Key personnel (management) candidates and advanced specialists

Group M: Operational and on-site leaders

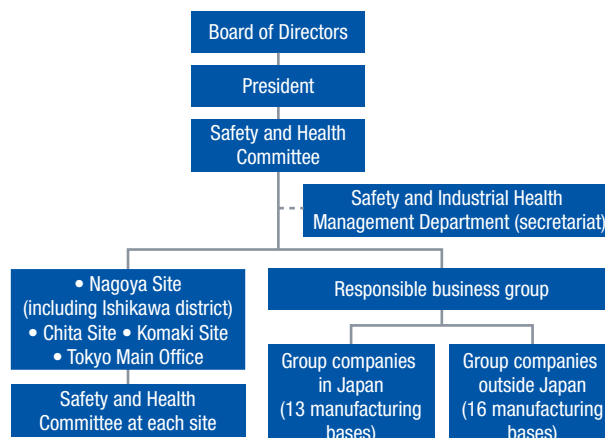
Group J: Personnel who seek to actualize, and be utilized to, their full potential

Safety and Health

In 2007, NGK introduced an Occupational Safety and Health Management System (OSHMS) in line with its Safety and Health Policy. The OSHMS serves as a mechanism for the ongoing, systematic implementation of employee health and safety initiatives. Since then, we have ensured that this system is diligently implemented and that risk assessment-based safety measures are strictly followed. As a result, in 2017 the Japan Industrial Safety and Health Association (JISHA) issued the first ISO-45001 private certification in Japan to our Nagoya Site. This was followed by other sites in 2018, namely the Chita and Komaki Sites, and now all of our business sites and plants throughout Japan have received ISO-45001 private certification and JIS Q 45100 2018 DRAFT certification.

We also make a concerted effort to promote better health and wellbeing among our employees, for which we have been included in the 2019 “White 500” list under the Health and Productivity Management Organization Recognition Program, run by the Ministry of Economy, Trade and Industry and Nippon Kenko Kaigi.

Structure to Promote Safety and Health Management



Safety and Health Policy

Maintaining the safety and health of each employee constitutes the basis for a company's operation and existence

1. Comply with occupational safety and health laws and company regulations.
2. Engage in activities in line with the OSHMS* to continuously raise the safety and health standards.
3. Promote safety and health activities under enough education and training and good communication with employees.
4. Reduce the risks of hazards and toxicity and prevent accidents to provide a comfortable work environment.
5. Prevent employees' health hazards and enhance health promoting activities.

*OSHMS: Occupational Safety and Health Management System

Health Declaration

Health Declaration of the NGK Group

At NGK, we consider employee health and safety to be of fundamental importance to the company's operation and are, therefore, proactive about developing dynamic, people-friendly work environments and a health-conscious corporate culture, which contribute to better health for each and every employee.



Activities to Promote Safety and Health Management in FY2018

	Main points	Priority activities
NGK (non-consolidated)	Improve managers' risk management skills	<ul style="list-style-type: none"> • Expanding practical risk assessment seminars to technical workplaces • Improving the level of hazard source identification activities at each production site
	Improvement of the self-management system	<ul style="list-style-type: none"> • Reviewing work instruction and risk assessment activities • Actively developing "Near miss" activities and incorporating them into risk assessment
	Improvement of hazard awareness and strengthening of hazard prediction ability	<ul style="list-style-type: none"> • Launching hazard simulation/hazard prediction training school run by in-house instructors
	Promotion of health hazard prevention at priority workplaces	<ul style="list-style-type: none"> • Analyzing and responding to stress check results • Making improvements to mitigate potential for operations to negatively impact health
Group companies in and outside Japan	Strengthening of compliance and augmentation of risk identification and awareness-raising systems	<ul style="list-style-type: none"> • Developing mechanisms to ensure legal compliance • Promoting risk assessment activities • Acquire international standards certification (newly acquired by six companies)

Activities to Promote Safety and Health Management in FY2019

Medium-term action plan	FY2019 action items	Priority activities
Identify serious hazard risks and strengthen preventative measures	Evaluate rotating equipment, explosion, and electrocution risks	<ul style="list-style-type: none"> • Focus on identifying risks for ancillary, irregular, and non-standard operations • Identify high-risk operations and implement hard infrastructure measures • Clarify and raise awareness of risk confirmation rules
Develop a more fully integrated governance structure	Set in place governance systems at Group companies	<ul style="list-style-type: none"> • Fully resolve outstanding issues at each company and perform follow-up auditing • Follow up on certification-related work by companies not yet ISO 45001-certified • Develop a more comprehensively delineated governance structure for each Business Group
Improve on-sight management strength of persons in charge	Implement job grade-specific training (division general managers, plant managers, managers)	<ul style="list-style-type: none"> • Assess current level and specify target personnel for training • Strengthen risk assessment training (facilities and equipment, operations) • Implement worksite capability consultation committees for each job grade

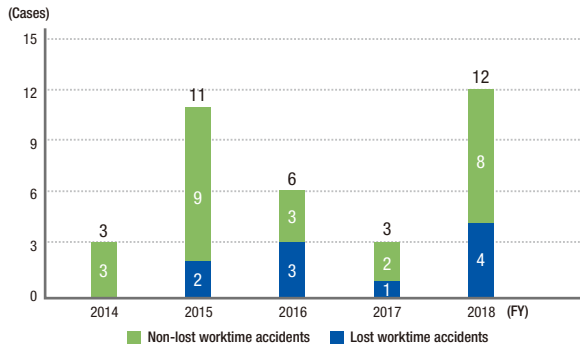
Enhancing Safety and Health Activities

NGK views the enhancement of safety and health activities as one of its top priorities. As such, we developed a medium-term action plan in fiscal 2016 built around the key themes of compliance, risk reduction, and enhanced governance and have undertaken activities based upon it. During fiscal 2018, which was the final year of this plan, our focus was on ensuring thorough implementation of risk reduction measures as well as developing and maintaining robust legal compliance and governance

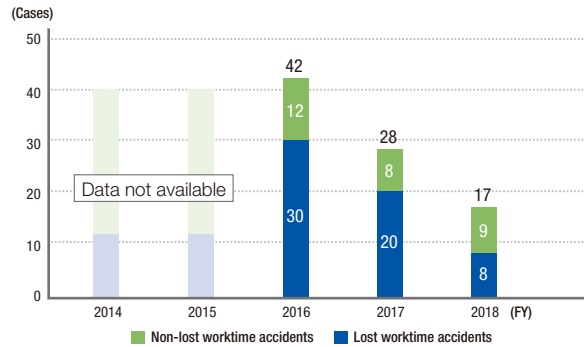
structure mechanisms at NGK and other Group companies.

In addition, we have promoted the acquisition of international occupational safety and health management system certification by all manufacturing-related Group companies in Japan and overseas. As of the end of fiscal 2018, more than half of all Group companies have ISO-45001 or OHSAS-18001 certification.

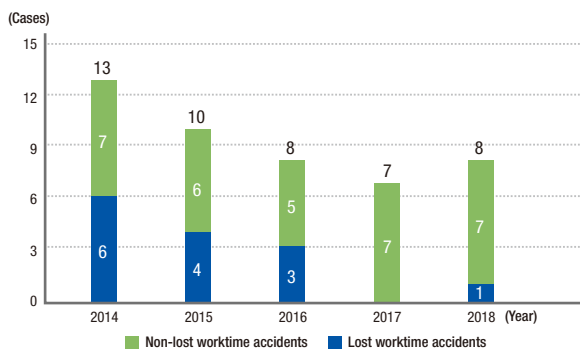
Work-Related Accidents (NGK)



Work-Related Accidents (Group companies outside Japan)



Work-Related Accidents (Group companies in Japan)



Severity Rate

(the number of lost workdays per 1,000 hours worked)

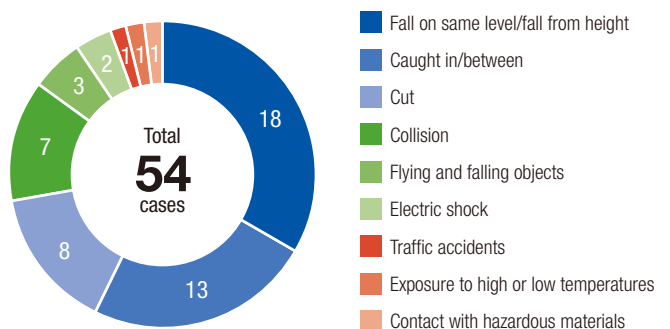
	FY2014	FY2015	FY2016	FY2017	FY2018
NGK	0.000	0.007	0.0036	0.0002	0.7430
Group companies in Japan	-	-	0.0086	0.0000	0.0004
Group companies outside Japan	-	-	0.0403	0.0219	0.0154

Rate of Lost-Worktime Injuries (NGK)

(the number of lost-worktime accidents per a million hours worked)

	FY2014	FY2015	FY2016	FY2017	FY2018
All industry total	1.66	1.61	1.63	1.66	1.83
Manufacturing industry total	1.06	1.06	1.15	1.02	1.20
NGK company-wide total	0.00	0.29	0.34	0.11	0.40
Group companies in Japan	-	-	0.50	0.00	0.14
Group companies outside Japan	-	-	1.42	0.91	0.34

Non-Lost Worktime Accidents by Type (past 7 years; NGK)



Rate of Occupational Disease (NGK)

	FY2014	FY2015	FY2016	FY2017	FY2018
	0	0	0.11	0	0.10

Number of Deaths from Work-Related Accidents (NGK and Group companies in Japan)

	FY2014	FY2015	FY2016	FY2017	FY2018
(Person)	0	0	0	0	1*

*In fiscal 2018 there was one work-related fatality. This fatality was the result of a traffic accident involving the truck of another company, which struck an NGK employee in a crosswalk.

External Certification on Occupational Safety and Health Management System

In order to help reach our medium-term safety and health targets, we encourage all companies within the NGK Group to acquire international occupational safety and health management system (OSHMS) certification.

With regard to NGK Insulators (non-consolidated), in 2018 the Chita and Komaki Sites joined the Nagoya Site in securing ISO-45001 certification. Now all NGK business sites and plants in Japan have integrated ISO-45001 certification. In addition, 14 manufacturing-related Group companies in Japan and overseas have ISO-45001 or OHSAS-18001 certification.

Rate of Acquiring Management System Certification: End of FY2018

NGK (Site and factory)	100%
Manufacturing Group companies in Japan	58% (7/12)
Manufacturing Group companies outside Japan	40% (6/15)

Acquisition of Management System Certification (as of end of FY2018)

NGK	All sites and plants acquired ISO-45001 and JIS Q 45100 certifications	
Group companies in Japan	Five companies acquired ISO 45001 certification: NGK Okhotsk, Energy Support, NGK Ceramic Devices, NGK Fine Molds, Ikebukuro Horo Kogyo. Two companies acquired OHSAS-18001 certification: NGK Adrec and Akechi Insulators.	
Group company outside Japan	Six companies acquired OHSAS 18001 certification: ACC, ACP, ACS, ACE, ACU, and ACM. Note: ACC: NGK Ceramics Suzhou ACE: NGK Ceramics Europe ACP: NGK Ceramics Polska ACU: NGK Ceramics USA ACS: NGK Ceramics South Africa ACM: NGK Ceramics Mexico	

Establishment of Hazard Simulation and Hazard Prediction Training School

To help lower the incidence of work-related accidents caused by younger and less experienced employees, in June of 2018 we replaced NGK's old and simple training center with a 450 m² Hazard Simulation and Hazard Prediction Training School at the Chita Site where we have begun running safety training courses taught by specialist employees with a great deal of outside expertise. The Training School features equipment, mannequins, and other tools that enable participants to learn first-hand about occupational hazards, such as becoming entangled or crushed by cranes or rotary devices. Also, in addition to general hazard training, more practical simulation training is incorporated into training programs that are aimed at heightening participants' hazard awareness. In fiscal 2018, approximately 1,400 employees participated in these training programs.



Hosting a Safety Process Expert Meeting (PEM)

NGK's Ceramic Products Business Group invites overseas production site safety and health managers to its yearly Safety Process Expert Meeting (PEM) to review and discuss ways to improve safety levels across the NGK Group. In fiscal 2018, a total of 29 employees from HONEYCERAM® production bases in Japan and overseas gathered at NGK Ceramics Europe in Belgium to exchange safety-related information and ideas. Additionally, the Safety & Industrial Health Management

Department provided a progress report on the NGK Group's occupational safety and health action plans and policies, incidence of accidents, and other relevant information. Afterwards, all participants toured the company's manufacturing operations and identified sources of potential danger as well as the good points and points to improve for the countermeasures in place. These discussions produced a number of new insights and greater awareness.

TOPIC

Company-Wide Forklift Safety Tournament

The Safety & Industrial Health Management Department held the second Forklift Safety Tournament at the Chita Site. The aim of this tournament is to serve as a complement to knowledge and skill acquisition done through classroom learning and competition, seeking to promote greater safety awareness for forklift operations by further invigorating forklift safety activities at individual work sites. Continuing from the previous, the company-wide tournament was held with the hope that it would serve as a venue for idea and information exchange between work sites. On the day of the tournament, 16 employees selected from the Nagoya, Chita and Komaki sites, as well as the Ishikawa Plant, competed against one another in a demonstration of knowledge and technical skill.



Restricting Long Work Hours

Since July 2016, we lowered the maximum amount of overtime work to 70 hours per month (with an upper limit of 300 hours per half-year). We strive to reduce overtime by clarifying work priorities at each division, revising the cross-sectional division of roles within a department, and other improvements.

Following Up on Employees Working Long Hours

NGK provides employees working long hours, including non-regular and part-time employees, with ongoing opportunities to meet with industrial physicians for health consultations and exams. The results are reported to and followed up on by Safety and Health Committees at each worksite. Also, the medical status of employees working long hours and the condition of those who need medical treatment are reported at monthly Safety and Health Committee meetings in an effort to thoroughly promote the reduction of overtime work.

Promotion of Activities Supporting Mental and Physical Health

Four Types of Care for Mental Health

We facilitate the widespread implementation of ongoing mental and physical health promotion activities, centering on the four types of care for mental health promoted by the Ministry of Health, Labor, and Welfare.

In fiscal 2018, we carried out stress checks for all employees. The results were subjected to group analysis. We are improving workplace environments where stress levels are high—such as by providing training for managers—and confirming the effectiveness of these improvement measures.

Position-Based Mental Care Education

We also conduct ongoing stratified mental care education. Continuing on from the previous fiscal year, in fiscal 2017 we selectively provided mental health education to managers in order to further enhance our recent key initiatives on line care (care by supervisors). We are also incorporating it into the job grade-specific education for new managers to deepen their understanding of mental health.

Overtime Work Hour Trends: General Employees

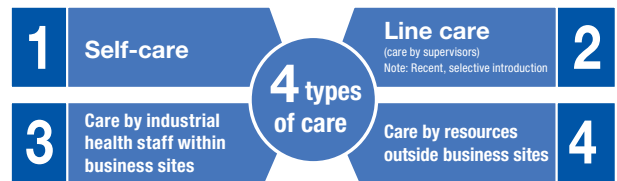
Hours worked (per person)	FY2014	FY2015	FY2016	FY2017	FY2018
Annual fixed working hours	1,919	1,919	1,919	1,919	1,919
Annual actual working hours	2,077	2,087	2,069	2,072	2,081
Average overtime work per month	24.5	24.9	23.7	24.3	25.2

Consultations by Employees Working Long Hours

Interviewees (persons)	FY2014	FY2015	FY2016	FY2017	FY2018
General employees	63	154	68	65	101
Managers	46	72	40	20	142

Note: Numbers of people shown are cumulative totals.

Four Types of Care



Position-Based Mental Care Education at NGK

(Persons)

	FY2014	FY2015	FY2016	FY2017	FY2018
New hires	56	199	234	158	192
General employees	291	272	325	181	306
Managers	95	87	450	63	69

Diversity

It is NGK Group's basic policy to recruit human resources and offer stable employment and equal opportunities regardless of race, nationality, gender, age, religion, creed, disability, or gender identity/sexual orientation. Also, in an aim to promote autonomy and independence, NGK maintains the human resource systems necessary to provide employees with fair compensation commensurate with their degree of contribution to the company.

NGK New Graduate Hires

Note: Excluding new graduates planned to transfer from temporary to regular positions. (Persons)

Joined company	University graduate			Junior college/ vocational school graduate	High school graduate, other
	Total	Men	Women		
April 2015	38	29	9	0	60
April 2016	94	67	27	0	46
April 2017	65	50	15	0	51
April 2018	104	72	32	0	47
April 2019	96	69	27	0	47

NGK Mid-Career Hires

(Persons)

Joined company	Total	University graduate men	University graduate women	Other men	Other women
April 2014–March 2015	49	15	4	30	0
April 2015–March 2016	200	69	12	116	3
April 2016–March 2017	158	66	15	73	4
April 2017–March 2018	135	58	12	63	2
April 2018–March 2019	115	72	12	29	2

System to Promote Diversity

At NGK, the Human Resources Department plays a central role in promoting diversity, including through nursing care support and promotion of women's active participation.

Regarding human rights issues, NGK strives to educate employees by distributing booklets on human rights on occasions such as training for the recently promoted employees. A helpline is also available for consultation on these issues.

Promoting the Success of Women

Launch of Women's Active Participation Promotion Project

Previously, the Human Resources Department has played a central role in NGK's efforts to promote more active participation by women, such as by expanding support systems and providing training to supervisors. However, the new Women's Active Participation Promotion Project launched in fiscal 2018 goes well beyond the Human Resources Department to incorporate members representing a broader, company-wide perspective.

Appointment of Female Key Personnel (Management Staff)

The NGK Group strives to increase opportunities for motivated and skilled people to enhance their skills regardless of gender. We are also engaged in creating comfortable working environment for women. The number of female key personnel (management staff) of NGK in fiscal 2018 was 20.

Ratio of Female Employees

	FY2014	FY2015	FY2016	FY2017	FY2018
Ratio of female employees*1	12.9%	12.6%	12.7%	12.5%	12.6%
Ratio of female general employees*2	16.1%	15.6%	15.5%	15.1%	15.2%

*1: Ratio among all employees

*2: Ratio among all general employees

Female Key Personnel (Managers)

	FY2014	FY2015	FY2016	FY2017	FY2018
Ratio of female key personnel*	1.5%	1.8%	1.8%	2.0%	2.2%
No. of persons	14	14	16	17	20
No. of department managers or higher	2	3	3	4	4

* Ratio among all key personnel

Ratio of Women in Managerial Positions at Group Companies Outside Japan

FY2015	FY2016	FY2017	FY2018
16.6%	15.3%	21.0%	16.0%

Promoting Women's Active Participation through the Revised Human Resource System

NGK has revised its human resource system, aiming to enable employees in general employment positions who were engaged in routine tasks to take on a broader range and a higher level of work.

The new human resource system supports career advancement of individual employees. They can take the initiative to challenge to move up to a higher job grade.

Establishment of a Career Consultation Helpdesk

In March 2016, we established a career consultation helpdesk for female employees to discuss career-related concerns. At the helpdesk, certified career consultants provide support and consultation services to employees, while strictly observing confidentiality. Since May 2017, we have expanded the service to make it available not only to women but to all employees.

Introduction of System to Support Early Return from Parental Leave

We have introduced a system to encourage and support employees so that they can return from maternity and childcare leave and resume their careers at an early stage.

Reference Page	System to support early return from parental leave	P64
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Training for Employees Returning from Childcare Leave

Training was provided for female employees returning after the end of their designated childcare leave period, as well as for their supervisors. During this training, participants were offered advice on how to orient their focus and coordinate their schedule in balancing work and family responsibilities, as well as how to go about developing a medium-to-long-term career plan. Despite being from different departments, all of the participants were alike in that they faced the challenges of balancing childrearing with work, and through their interactions with one another, they were able to share their stories, their struggles, and their advice.

Group J Clerical Staff Career Design Training

In line with the revisions made to NGK's human resource system for general employees in April 2017 (job grade standardization and extension of the mandatory retirement age to 65), Group J clerical staff were provided with career design training intended to serve as an opportunity for them to think about their future career path and work style. Through this training, participants examined the expectations of those around them, their own skills and values, and then objectively considered their career goals from a medium-to-long term perspective and what they need to do to achieve them. Participants not only utilized information provided by their instructors but also engaged in solo and group work to facilitate a deeper level of self-awareness and discovery.

Certified as an "L-Boshi" Company for Excellence in Promoting Women's Active Participation

In March 2017, NGK was certified as an "L-Boshi" company by the Minister of Health, Labor and Welfare (MHLW). This certification is granted to companies that have done excellent jobs in accordance with the Act on Promotion of Women's Participation and Advancement in the Workplace.

Each applicant for the certification is evaluated on five criteria: recruitment, employment continuity, working hours, percentage of female managers, and diverse career paths. By meeting four of these five criteria, NGK has received the second highest certification of the three levels.



Certified as a Company Promoting Women's Active Participation by Nagoya City*

In recognition of our efforts to create a workplace environment that encourages women's active participation such as revising our system for transferring to career-track positions, we were certified as a Company Promoting Women's Active Participation by Nagoya City in January 2012 and recertified in January 2018.

*A system for certifying companies that conduct outstanding initiatives in the areas of (1) awareness improvement, (2) work-life balance, and (3) promotion of women's active participation.



January 2012

Company Promoting Women's Active Participation (Nagoya City)

Submitting Our Action Plan for Promoting Women's Active Workplace Participation to MHLW

In January 2019, in accordance with the Act on Promotion of Women's Participation and Advancement in the Workplace, NGK submitted a general employer action plan to the Aichi Labor Bureau, which is overseen by MHLW.

In this plan, NGK sets the goal of hiring more female employees. Accordingly, the proportion of women among new hires increased from 16% in fiscal 2012 to 31% in fiscal 2018.

We will keep working on the initiatives according to the action plan to accomplish our goals.

Ratio of Women among New Graduate Hires at NGK

	Hiring target	FY2016	FY2017	FY2018	FY2019
Ratio of female university graduates (total)		29%	23%	31%	28%
University (administrative-related)	30%	42%	27%	42%	44%
University (engineering-related)	20%	13%	20%	22%	24%

Action Plan

Issues

- Although there is no gender gap in terms of criteria for promotion and service years, the number of women in management positions is small.

Goals

- Foster a corporate culture that promotes women's active participation.
- Increase the number of candidates for managers by 1.5 times.

Initiative 1 Create an environment that makes it easier for women to achieve a work-life balance.

Initiative 2 Increase the ratio of women among new graduate hires and diversify career opportunities.

Promoting Participation of Older Employees

As part of changes made to the NGK Insulators personnel system in April 2017, the mandatory retirement age has been raised to 65. Salary levels, bonuses, and benefits have all been kept at the same level as of age 60. Our goal is to ensure employees to work without worries even after they turn 60. More robust systems and support have been introduced for employees with illness or nursing care needs, such as more flexible work schedules offering shorter hours and three-day work weeks, or a lump sum nursing care support allowance for employees caring for their parents or spouse.

I want to keep delivering new products to the world right up until retirement

I turned 60 in 2017, which is the same year that NGK raised the mandatory retirement age. My job is designing and drawing plans for new sensors used in automobiles. I have worked with sensors for the past 36 years, having been involved with everything from sensor design to production technology and production control. There are a lot of young developers working in the same office with me, so I also help to train them. I have so much that I have to do, but it also means that I have new and interesting challenges every day.

Before the raise of mandatory retirement age, employees had the option of applying to be rehired mostly as a support role, but now that I am able to remain right on the front line, it naturally enhances my sense of motivation.

I have three and a half years until mandatory retirement age of 65. Until then, my primary goal is to keep delivering new sensors to the world. I will also devote my energies to help my young colleagues become worthy successors.



Advanced Development Department,
Sensor Division, Ceramic Products
Business Group

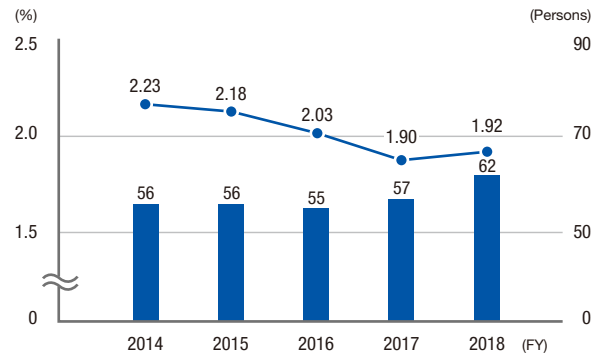
Nobukazu Ikoma

Employment of Persons with Disabilities

NGK undertakes a variety of initiatives aimed at employing people with disabilities, such as accepting students from special-needs schools as trainees and attending employment seminars for people with disabilities.

In fiscal 2018, three of our new hires were people with disabilities. Additionally, NGK has hired its first visually impaired employee. In terms of the legally mandated employment rate, because the total number of employees at NGK continues to grow, employees with disabilities remain around 1.9% of all employees. However, we continue to work to improve this by accepting students from special-needs schools as trainees and attending employment seminars for people with disabilities. Also, in addition to new hires, we are working to increase the number of mid-career hires who are people with disabilities.

Number and Percentage of Employees with Disabilities (NGK)



Various Systems to Make Use of Diverse Human Resources

The NGK Group implements systems promoting the utilization of human resources based on the idea that personnel diversity is linked to innovation in organizational culture.

Human Resource Utilization Systems Aligned with Employee Individuality and Skills

To open the way for employees to take full advantage of their individuality and skills, NGK adopts an internal job application system, in which open positions are announced internally and eligible applicants are appointed. There is also a career follow-up system for career track registration enabling applicants to register their work history, qualifications, and desired position to provide an opportunity for individuals to carry out their work duties with a sense of satisfaction. And an FA (free agent) system allows employees to register their personal aspirations and preference of jobs to appeal themselves within the company.

Internal Job Application System (NGK)

	FY2014	FY2015	FY2016	FY2017	FY2018
Applications (cases)	19	28	17	32	28
Recruits (persons)	23	36	28	50	40
Applicants (persons)	12	23	11	15	7
Successful applications (persons)	8	9	4	5	2

Career Follow-Up System

	FY2014	FY2015	FY2016	FY2017	FY2018
Registered (persons)	2	2	0	3	4
Transferred (persons)	1	0	0	1	0

Promoting the Regular Employment of Manufacturing Contract Employees

NGK established a system for appointing manufacturing contract employees to become regular employees, and 37 employees were appointed in fiscal 2018. Excellent employees are identified through biannual personnel assessments and recommended by division heads to sit for the regular employee promotion exam. Those who pass the exam become regular employees.

Excellent workers out of the ones who transfer to regular employment positions also have a chance for promotion to two higher ranks of company qualification.

In fiscal 2018, two employees underwent accelerated promotion via this system.

Transfers from Contract Manufacturing Worker to Regular Employee (NGK)

	FY2014	FY2015	FY2016	FY2017	FY2018
Converted (persons)	27	25	15	20	37

Accelerated Promotions (NGK)

	FY2014	FY2015	FY2016	FY2017	FY2018
Promoted (persons)	4	11	11	6	2

Management of Follow-up System to Fit Young Employees in the Workplace

To prevent career mismatches, there is a follow-up system for younger employees in NGK. For career-track employees, we conduct surveys and interviews about their jobs and work environment in their second year; and for manufacturing technology staff, we do this in their second or third year of employment. If they desire, feedback is provided to their superiors, leading to younger employees' job stability. A job rotation system is also provided mainly to young career-track employees. After working with us for four to six years, they are transferred to a different job—potentially overseas or outside their current department.

Come-Back System

In fiscal 2016, NGK launched the Come-Back System to rehire people who had left our company for various reasons (e.g., job change, studying abroad, job transfer of a spouse, etc.) as mid-career employees.

Reference
URL

Come-Back System

<https://www.ngk.co.jp/recruit/comeback/>

Work-Life Balance

To promote a work-life balance and reduce long working hours, in fiscal 2011, NGK formulated specific rules based on initiatives that had been conducted by labor-management over the previous three fiscal years.

We keep track of social changes, such as changing attitudes toward work as well as legislative amendments, and strive to respond to these changes flexibly and properly by improving systems and revising operations.

Nine Rules for Promoting a Work-Life Balance

- No more than 70 hours of overtime work per month.
- Overtime work exceeding 45 hours per month limited to six months each year.
- At least six days of paid leave must be taken each year.
- No more than 300 hours of overtime work per six months.
- In principle, there will be no overtime work on refresh days (Wednesdays and Fridays).
- If overtime is necessary, a prior permit application must be submitted.
- In principle, work must not be performed for more than seven days straight.
- If work in excess of seven days straight is necessary, a prior permit application must be submitted.
- Written applications must be submitted when requesting employees to work on holidays or late at night.

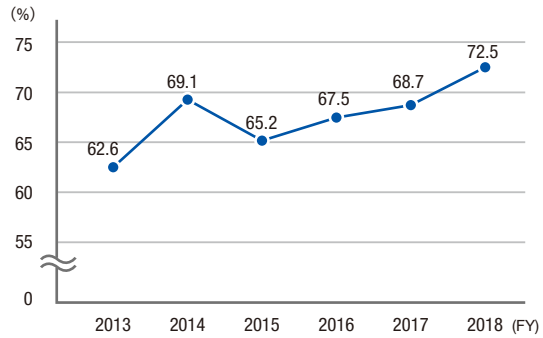
Initiatives to Limit Overtime Work

If, for any reason, overtime work in excess of 45 hours per month appears likely, the reason for the increase in overtime work must be confirmed through prior labor-management consultations to level out the time periods and workloads or increase the number of employees.

Countermeasures for Mitigating Increased Overtime Working Hours

Each year, NGK discloses statistics on hours worked and paid leave utilization to its Labor Union for discussion and countermeasure deliberation purposes. When cases of long working hours are found, Labor Union meets with each workplace to devise countermeasures. When long working hours are found for employees who have been temporarily assigned overseas, they must submit in writing the reason for the long working hours and undergo a health check. These measures are taken to maintain their health, and the written report is used to identify the reasons for long working hours and to develop countermeasures.

Rate of Paid Leave Utilization (NGK)



For the sixth consecutive year, 99% of employees used six or more granted days of paid leave

For more than 10 consecutive years, the average number of days used for granted paid leave exceeded 10

For more than five consecutive years, usage of granted paid leave exceeded 60%

Enhancing Systems for Supporting Work-Life Balance

NGK offers flexible systems to help employees maintain a balance between work and family life. To support childcare and nursing care, we are enhancing financial support by providing a babysitter expense subsidy system, and a lump-sum payment system for nursing care support. And in consideration of the working environment, we offer support via a shortened working hour system.

Further, we continue to enhance the soft infrastructure NGK has in place to support these employees. For employees seeking to balance their career with childcare, we offer pre-maternity leave interviews, pre-reinstatement interviews during the childcare leave period, career consultations, and other consultation resources. For employees undertaking nursing care, we offer nursing care-related information sessions and distribute nursing care handbooks, as well as facilitate consultation services which make use of outside resources.

Enhancement of Work-Life Balance Systems

In 2010, NGK made a major revision to its human resource system, and we have since been continuously enhancing our support measures by identifying employees' needs. One recent example is the establishment of a system in 2013 to allow employees to take a leave of absence for accompanying a spouse posted overseas for work.

In fiscal 2016, we responded to the needs of employees who would like to gradually increase their working hours linking with their child's growth. The accommodation was made possible by relaxing restrictions set up for children's age for which the exemption from unscheduled work and limitation on overtime work apply. We have also introduced Childcare Concierge* services for employees working in the Tokyo metropolitan area, where it is difficult to find daycare centers.

In fiscal 2017, we established an early reinstatement lump-sum system for employees who return to work early from their childcare leave (within 11 months of the start of their childcare leave). We also established a non-registered daycare subsidy system to help subsidize employees who

put their children in non-registered daycares. These systems are part of the initiatives we undertake to support employees' careers after they have returned to work. Also, in addition to childcare and nursing care, we launched a system for flexible work arrangements to help employees who need to attend to a health condition of their own that requires repeated and ongoing treatment, thereby finding a balance between work and medical care.

In fiscal 2018, we investigated how to improve the efficiency and productivity of workplaces by offering employees greater flexibility in terms of work style and environment, so that they can work to their potential while maintaining a healthy work-life balance, regardless of when or where they work. It was in this context that we introduced a telecommuting system intended to help address the needs of employees with children or family members who require care, or who have a serious illness themselves.

*Services to help facilitate the process of finding a daycare center and returning to work. They include tailored support for individual employees during childcare leave to help them find a daycare center and giving advice in preparation for their return to work.

System to Support Employees to Balance Work and Childcare at Each Stage

		Interview (employee, supervisor, and HR)		Interview (employee, supervisor, and HR)	
		During pregnancy	Before/after birth	During childcare leave	Balancing work and care
Work systems		Measures on health management Overtime work exemption Late-night working hours exemption Flex time system	Time off before/after birth Special paid leave when a spouse gives birth Childcare leave (using accumulated vacation days)	Childcare leave Continuing the childcare leave	Shortened working hours Flex time system Unscheduled work exemption Limitation on overtime work Late-night working hours exemption Half-day paid leave Caring for a family member (using accumulated vacation days) Caring for a child
	Other systems			Childcare Concierge (for those living in the Tokyo metropolitan area)	Priority use of a commuter parking lot (in Nagoya) Non-registered daycare expense subsidy
Financial support systems	Family Fund		Maternity gift		Babysitter expense subsidy Elementary school enrollment gift
	Insurance benefits	Health insurance	Lump-sum birth allowance		
		Employment insurance			Lump-sum childcare leave allowance
Salary		During the time off before/after birth, pay 2/3 of the standard daily wage	Unpaid		Lump-sum payment made six months after returning to work (330,000 yen)
Bonus			During the time off before/after birth, pay a bonus calculated with a 2/3 attendance rate	Unpaid	

Systems to Support Early Return from Parental Leave

NGK has systems to encourage and support employees who have taken maternity and childcare leave so that they can return to their careers at an early stage.

These systems are aimed at developing workplaces that support female employees in particular, with the expectation of promoting their active participation.

Systems to Support Early Return from Parental Leave

- A lump-sum payment for early return
- Licensed daycare center expense subsidy
- Childcare Concierge

Overview of Childrearing Support Measures and Users

Systems That Exceed Legal Requirements

System name	Details		FY2014	FY2015	FY2016	FY2017	FY2018
Childcare leave	Until the last day of the month when the child turns one year old. When there are certain circumstances, such as not being able to find a daycare center, leave is available until the last day of the month in which the child turns 18 months old or the end of March after the child turns one, whichever is longer (Legal requirement: until the child turns 18 months old)	Women	52	49	44	36	27
		Rate of parental leave takers	100%	96%	100%	100%	100%
		Rate of returned	100%	100%	100%	100%	100%
		Rate of employees still working a year after returning to work	100%	100%	100%	100%	—
		Men	12	11	7	17	27
		Of which returned to work (Rate of returned)	12 (100%)	11 (100%)	7 (100%)	17 (100%)	27 (100%)
Shortened working hours during childrearing	Six or seven hours per day for employees until the fiscal year when their children start fourth grade in elementary school (Legal requirement: For children under the age of three)	Rate of employees still working a year after returning to work	100%	100%	100%	100%	—
		Users	43	53	57	51	63

Systems Operated Independently by NGK

System name	Details	FY2014	FY2015	FY2016	FY2017	FY2018
Lump-sum payment made six months after returning to work	Lump-sum payment is paid six months after returning to work	20	16	26	19	31
System for taking annual paid leave in hourly increments for employees working shortened hours	Paid leave can be taken in hourly increments by employees working shortened hours for five days	18	35	36	36	59
Childcare leave for fathers	Unused annual paid holidays can be used for childcare leave	12	11	7	17	19
Pre-maternity leave interview	Interview is attended by employee, HR, and supervisor to provide the employee with peace of mind while on maternity leave and ensures both sides have proper understanding of procedures related to systems supporting childcare and work	25	22	20	27	30
Interview before returning to work	Supports smooth transition back to work through consultation on work details and work style	14	27	18	30	29
System for accompanying a spouse's overseas assignment	Enables employees to take a leave of up to two years and six months while accompanying a spouse (including a non-NGK employee) posted overseas for work, and allows employees to continue their career path, which was difficult to do prior to the establishment of this system	1	2	2	6	1
Maternity gift (Family Fund)	¥50,000 gift when a child is born	183	175	208	225	241
Elementary school enrollment gift (Family Fund)	¥50,000 gift when a child enrolls in elementary school	137	124	142	151	172
Babysitter expense subsidy (Family Fund)	Provides up to ¥100,000 per year for employees who must pay for a babysitter or daycare due to working hours	13	16	19	9	8
Childcare Concierge (for those living in the Tokyo metropolitan area)	Support to facilitate the process of putting a child in daycare and returning to work	Unintroduced	Unintroduced	2	1	1
Priority parking spaces to support childcare (for those working at headquarters)	Priority parking spaces available at a commuter parking lot	12	17	19	29	32
A lump-sum payment for early return		Unintroduced	Unintroduced	Unintroduced	1	0
Non-registered daycare subsidy system		Unintroduced	Unintroduced	Unintroduced	3	7

Systems to Support Nursing Care

Working hours	Time off	Financial support
<ul style="list-style-type: none"> ① Shortened working hours ② Working 3 days a week ③ Flex time system (for employees at departments to which the regular flex time system does not apply) ④ Limitation on overtime work ⑤ Unscheduled work exemption ⑥ Late-night working hours exemption 	<ul style="list-style-type: none"> ⑦ Caring for a family member using accumulated vacation days ⑧ Unpaid days off to provide care 	<ul style="list-style-type: none"> ⑩ Care leave benefits ⑪ Care leave support fund ⑫ Lump-sum care allowance
	<div style="background-color: #0056b3; color: white; text-align: center; padding: 2px;">Leave of absence</div> <ul style="list-style-type: none"> ⑨ Care leave 	

Nursing Care Leave Usage (NGK)

	FY2014	FY2015	FY2016	FY2017	FY2018
No. of employees taking nursing care leave	0	0	0	1	0

Company Intranet

We have launched a site on diverse work styles on the company intranet to widely announce our measures to support a work-life balance. The new site is a redesigned and more user-friendly version of the previous Work and Family Life Support Site. Its new features include, for example, an online handbook on childcare and nursing care.

Revision of the Care Leave System

In line with revisions made in January 2017 to the Child Care and Family Care Leave Act, we made revisions to our own system, such as enabling employees to divide their one-year nursing care leave into three blocks. Moreover, we have signed a corporate contract with SeaCare, an NPO that supports care-giving, to further enhance services helpful to caregivers.

This service makes care-giving consultations available free of charge, regardless of whether Certification of Needed Long-Term Care has been obtained, and enables employees to receive support in care-giving when they are unable to do so.



Ministry of Health, Labor and Welfare
Next-generation support certification logo
"Kurumin" (2012)



Ministry of Health, Labor and Welfare
"L-boshi" certification of corporate
excellence in the promotion
of women's active participation
Certification level 2 (2017)



Nagoya City
Certification of corporate promotion
of women's active participation
(2011)



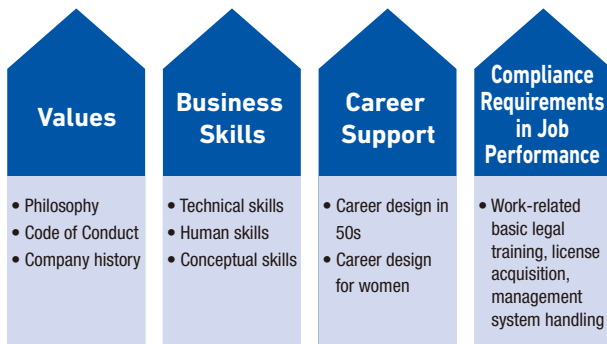
Aichi Prefecture
Certification of Aichi
"Shining Women" Companies
(2016)

Human Resource Development

The NGK Group puts its Group Philosophy into action by ensuring that people remain our top priority. We do this not only through the educational programs that we offer but also by cultivating work environments and supportive supervisors capable of ensuring that each employee is able to contribute and independently grow through the work that he or she undertakes within the environment in which he or she is placed.

Human Resources We Aim to Develop

- ① Individuals who are bold and tenacious when overcoming challenges
- ② Individuals who are able to work in teams to get results
- ③ Individuals with the skills and sense needed to carry on business activities across borders



Why What How Must

NGK Insulators undertakes systematic human resource development, which encompasses every job category in the Group companies in Japan, from employment to every promotion milestones in his or her career.

The comprehensive education and training we provide for the NGK Group in conjunction with each employee's department is divided into four areas: the "Values" necessary to put the NGK Group Philosophy into practice, the "Business Skills" necessary to successfully carry out their work, the "Career Support" necessary for your advancement and, lastly, "Compliance Requirements in Job Performance."

Company-Wide Human Resource Development System

NGK designs human resource development initiatives based on management and business challenges that affect the entire company. We appropriately incorporate all departments connected with education and training, and we ensure that the training and education programs we provide cover everything without any omissions or repetitions in content. Towards that end we have established an:

- Education Council to deliberate on human resource development systems, policies, and plans to be implemented company-wide;
- In-house Training Liaison Committee to raise awareness of human resource development policies and to consolidate the various challenges and human resource development needs of the different departments; and an
- Education Coordination Committee to take the departmental needs and work together with the departments that will implement training and education to deliberate on the nature and direction of policies to be implemented in response. These three deliberative bodies operate according to an annual plan for the purpose of ensuring that training and education is carried out company-wide in an appropriate manner with content that is undergoing continual improvement.

Training Participant Summary (total participants)

	FY2015	FY2016	FY2017	FY2018
Total participants	3,988	4,002	3,889	4,661
Key personnel	892	933	1,132	991
General employees	3,096	3,069	2,757	3,670

Average Time Spent in Training Annually per Employee (hours)

	FY2015	FY2016	FY2017	FY2018
Total	21.0	24.8	21.7	21.3
Key personnel	15.3	13.1	15.6	12.8
General employees	22.5	28.8	23.3	25.0

Average Annual Cost of Training per Full-Time Employee (¥10 thousand)

	FY2014	FY2015	FY2016	FY2017	FY2018
Average expenses	11	7.8	7	6.6	6.3

Note: Calculated based on actual achievements from FY2015.

Values

NGK training and education seeks to foster an understanding of the NGK Group Philosophy and Code of Conduct such that employees will not simply work for the sake of meeting their individual job targets but, rather, will think about the significance of the work they perform and the basis for their decision-making, leading to a sense of pride and shared identity as an NGK employee. It is not enough for employees to know what the NGK Group Philosophy and Code of Conduct are; we want employees to incorporate them into their behavior.

This approach is particularly evident in the corporate history training program that was launched full-scale in 2017 for every level of employee, from new hires to those promoted to managers. It is also incorporated into the educational programs of Group companies outside Japan in order to reach a variety of personnel. It will continue to be developed and expanded.

Business Skills

We carry out training designed to equip employees with the mindset, knowledge, and skills they need to carry out their jobs. To ensure that the skills employees acquire are applicable and directly contribute to the work that they perform—i.e., practical skills instead of just knowledge—we provide coaching in cooperation with the participants' supervisors and training programs for handling challenges directly relevant to their own departments.

Career Support

In order to ensure that as many personnel as possible are able to actively participate in and contribute to the functioning of NGK, we provide employees with career development support in the form of a variety of effective HR initiatives, such as initiatives to promote the active participation of women and extending the mandatory retirement age. This support is focused on cultivating personnel capable of thinking outside the limits of predetermined career models to chart their own career path.

Career design training programs for women, employees in their 50s, and others serve as opportunities for employees to think about who they want to be and how they can challenge themselves in their work to grow to become that person.

When it comes to diversity promotion, our focus is on ensuring that every employee is able to work to his or her full potential within the context of the many and varied environments that comprise the NGK Group.

Job Performance Compliance Requirements

We provide employees with training that communicates to them the responsibilities, which NGK bears as a corporate citizen, as well as what this requires of them as employees of NGK. This training seeks to instill a strong sense of ethics and a commitment to doing what is right.

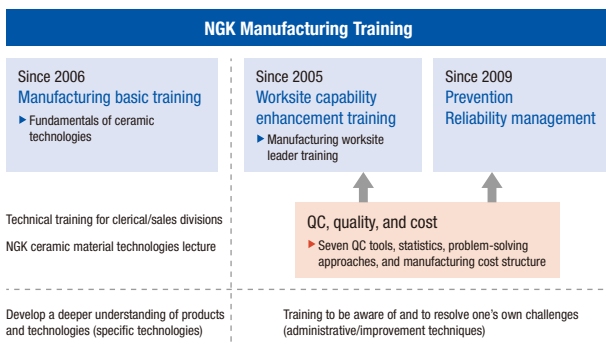
The fundamentals of NGK business—safety, quality, environment, and CSR—are inculcated from the time an employee joins the company to every time he or she receives a promotion so that knowledge ends up being reliably translated into action.

One of our priorities in fiscal 2018 was the establishment of a quality compliance system, and towards that end we revised and expanded our education and training programs.

Manufacturing Training

We pursue training aimed at conveying the central importance of safety, the environment, quality, timely delivery, and cost in manufacturing while passing on the traditions and spirit of NGK manufacturing. This training also aims to grow employees into individuals who can support the creation of new value.

Towards this end, we provide training in specific technologies that will deepen employees' understanding of NGK products and technologies, as well as provide training in administrative and improvement techniques that will equip employees with the mindset and means to improve their workplaces.



Manufacturing basic training is centered on practical training tied to the actual manufacturing process. It involves teaching participants about ceramic technologies and manufacturing in general at NGK so that they will have a broad perspective, which they can apply in their work.

Worksite capability enhancement training cultivates human resources capable of making managerial contributions as manufacturing worksite leaders who independently pursue worksite capability improvements together with others both inside and outside of their plant's organizational framework.

Innovation Training

The aim of innovation training is the cultivation of leaders suited to an era of transformation and speed. This is achieved by fostering outside-the-box thinking coupled with an ability to think and act to bring an idea to fruition.

In the program for young employees with leadership potential, participants learn about the essential innovation processes involved in generating new business. The program is held jointly with other companies. This allows interaction with employees from other companies who have different experiences and values, thus helping NGK employees develop a more multifaceted perspective. In fiscal 2018, employees from Toho Gas and Sumitomo Wiring Systems were included in the program.

The participants remarked at how this interaction with different companies' employees helped to broaden their perspective and how the hands-on, participatory nature of the training was extremely helpful, as it made them aware of so much more than they would have from passive learning.

Corporate History Training

This training program looks at the history of NGK in order to reexamine the origins of our corporate activities, to reinforce our shared values, and then to prompt participants to think about how this impacts the way they go about their jobs. The program for newly appointed managerial personnel incorporates corporate history materials related to topics, such as globalization or diversity, which are assigned to each participant group, along with a worksheet, that they discuss in depth in relation to the distinctive character of NGK.

Education programs for other job grades are being steadily introduced, as well as programs geared towards Group companies outside Japan.

Comments from a Corporate History

Training Participant
NGK Berylco UK

Laurie McNichol

I thought that the presentation about NGK's history and philosophy was first-class. It was very interesting to know how NGK has evolved over many decades into the great corporation it is today. Great to see the various component parts that make up our vast organisation and seeing the numerous marketplaces that we compete in. It certainly inspired me and I believe that all colleagues will be even more highly motivated after seeing the presentation. The consensus during MI meeting amongst people I spoke to was that all were impressed by it and were motivated to endeavour to achieve even greater success for our group.

It was also great to learn more about the NGK philosophy. These are wonderful values and ones that all decent human beings would and should happily embrace in our business life and in our personal life. It espouses great teamwork and respect for others which is a fundamental base for current and future success for the individual and therefore the collective.



English Instruction for New Employees

Since fiscal 2011, we have been providing English language courses for all new staff members with the goal of rapidly cultivating globally capable human resources. The one-year course is divided into classes based on student level. Besides studying the classroom materials, participants also take the initiative in their learning through activities such as creating their own class slogans.

Time spent learning English per new career-track hire
(fiscal 2018 results)

120 hours per year

Practical Overseas Training

NGK conducts practical training over a period of six months at overseas Group companies with the aim of developing globally minded human resources. The training focuses on developing practical business and communication skills in a cross-cultural environment targeting young employees who are future candidates for overseas postings.

Labor-Management Initiatives

Labor Union

NGK respects workers' rights, including the right to collective bargaining, and strives to build healthy labor-management relations. As of the end of March 2019, 3,852 employees belonged to the Labor Union.

Labor Union Membership Rate

End of March 2017	End of March 2018	End of March 2019
75%	75%	77%

Note: (Number of union employees including contract manufacturing employees)/(All NGK employees including contract manufacturing employees)

Protecting the Right to Collective Bargaining

NGK and the Labor Union have signed a labor agreement as equal partners. The agreement specifies that both parties shall respect each other's rights and take responsibility for the exercising of their own rights.

The two sides regularly hold Labor-Management Advisory Board meetings to exchange information and promote mutual understanding. They also maintain healthy labor-management relations by exchanging opinions on issues such as management policies, financial conditions, and activities of the Labor Union.

Collective bargaining sessions are held in an orderly manner, with both parties striving in good faith to resolve issues peacefully and promptly.

Labor-Management Consultations in Fiscal 2018

Regular Labor-Management Council meeting: held twice

Labor-Management Advisory Board meeting: held twice

Other bargaining and consultations

- Consultation on overtime work and work on days off
- Consultation on revision of the agreement
- Consultation on measures to rectify long working hours

Guaranteeing the Minimum Wage

NGK and the Labor Union have signed an agreement that sets out original in-house minimum wages, which are fixed at a rate above the minimum wages by region and industry stipulated by the Minimum Wage Act. Through this agreement, we strive to improve employees' working conditions and avoid violation of relevant laws.

Communication between Labor and Management

NGK makes an effort to build labor-management relations founded on mutual trust through communication with various consultative bodies, such as the Labor-Management Advisory Board, the Worksite Advisory Board, and the Regular Labor-Management Council.

NGK and the Labor Union hold Labor-Management Advisory Board meetings to talk about business conditions and performance, and Worksite Advisory Board meetings to share issues pertaining to manufacturing, work systems, and workplace environments from each worksite. In addition, at Regular Labor-Management Council meetings, labor and management also proactively exchange opinions.

Survey on Workplace Vitality

Once every two years NGK carries out a survey aimed at gauging and visualizing workplace vitality. The results of the survey serve as basic data, which facilitate discussion about personnel-related initiatives to create a more work-friendly organizational environment that offers employees a sense of challenge. In addition, the results from each workplace are provided as feedback to the respective manager, and each department considers and works on measures to help improve the daily work environment.

Implementation of Fair, Free, and Transparent Transactions

With a basic policy centered on the three principles of openness and fairness, partnership, and relationship with society, the NGK Group is engaged in fair and honest business transactions with the procurement partners in our supply chain.

Basic Approach

The NGK Group has established the Basic Purchasing Policy in an attempt to conduct fair and honest business transactions and to prosper together with all our procurement partners.

Supply Chain Management System

At NGK, the Purchasing Department is responsible for managing tier 1 suppliers. It also manages tier 2 and beyond suppliers that provide critical items such as raw materials. All supplier management is done in line with NGK's Supplier Management Regulations.

Reference Page **Communication Activities with Procurement Partners** P75

Familiarization of the Purchasing Handbook

Purchasing operations are directly related to various important aspects of corporate management, such as assets, production, development, and business performance, and also involve external and financial activities, major areas prone to compliance issues. In light of this, we created the Purchasing Handbook to summarize internal rules for purchasing engagement and issued the first edition of it in fiscal 2007. The Handbook has since been reviewed every year.

Efforts have also been made to better familiarize personnel with the tool: it has been made available on the company intranet and its significant objectives are discussed in company training programs, particularly for new managers.

Basic Purchasing Policy

Open and Fair

- Open, fair, and honest procurement
- Pursuit of the competition principles and profitability

Partnership

- Mutual prosperity based on mutual trust with suppliers

Relationship with Society

- Compliance with laws
- Preservation of the global environment



Fair and Honest Procurement Partner Evaluations and Extensive Resource Diversification

In accordance with the Basic Purchasing Policy, NGK selects procurement partners based on fair and honest evaluations. We also attempt to ensure procurement when disasters occur through the extensive diversification of procurement resources.

Selection of Suppliers Based on Fair and Honest Evaluations

NGK opens its doors to a wide range of procurement sources, including companies with which it has had no previous transactions.

In terms of selecting new suppliers, we choose from multiple companies through fair and honest evaluation of their CSR initiatives, environmental conservation efforts, and financial condition as well as quality, cost, and delivery (QCD). In addition to the procurement department being involved in the selection of suppliers, multiple departments are also involved in this process, which requires multi-stage approval before selection occurs in an effort to ensure fair and honest evaluation and decision-making.

Promoting Business Continuity Planning (BCP) through the Diversification of Procurement Resources

In the event of unforeseen circumstances such as a major natural disaster, NGK promotes the sourcing of raw materials, equipment, secondary materials, and other critical purchased parts from multiple suppliers as part of its BCP efforts to ensure procurement is uninterrupted. For items which are available from only one supplier, we ensure that we have sufficient inventory and that their storage facilities are located in a safe place that cannot be damaged by a tsunami. In addition, when selecting a new procurement partner, we take into consideration the existence or absence of multiple locations and efforts to ensure inventory.

Promotion of CSR Procurement

In response to the rising social expectation for CSR-oriented supply chain management, the NGK Group promotes CSR procurement. We preferentially select CSR-conscious companies and purchase CSR-sensitive raw-materials and services.

CSR Procurement Guidelines

The NGK Group created the CSR Procurement Guidelines in fiscal 2010 as a guide to promote CSR procurement across the Group including overseas Group companies. The Guidelines specifically describe our obligations as a socially responsible buyer as well as our requirements for socially responsible suppliers. In fiscal 2013, the Guidelines were expanded by being integrated with the previous Green Procurement Guidelines, which set forth rules for preferential purchase of environmentally friendly products and services, and adding provisions of conflict minerals, anti-corruption, human rights, and labor issues.

The expanded CSR Procurement Guidelines are publicly available on our website in multiple languages (Japanese, English, and Chinese).

Reference URL
CSR Procurement Guidelines and Supplemental Materials
<https://www.ngk-insulators.com/en/info/procure/>

Improving CSR Procurement

At the NGK Group, we develop activities to promote CSR procurement, such as visiting individual suppliers and conducting on-site inspections. We also request our suppliers, particularly new companies, to sign an agreement to comply with the CSR Procurement Guidelines. From fiscal 2016, we ask for annual renewal of the agreement in an effort to facilitate suppliers' awareness and understanding of CSR procurement while striving to increase the number of signers.

We will continue with these efforts, confirming partners' activities and keeping up with social trends, in order to maintain and enhance our CSR procurement.

Procuring Resources and Raw Materials Responsibly

The NGK Group conducts procurement activities that consider impacts on regional communities stemming from the use of raw materials (e.g. conflict minerals*) with the

potential to cause social issues such as human rights violations and poverty, and takes steps to avoid using such materials when there is risk of adverse impact.

*Minerals including tin, tantalum, tungsten, and gold produced in the Democratic Republic of the Congo and surrounding countries, and used as a source of funding for armed conflict in the area.

Enhancement of Procurement Capabilities of Group Companies Outside Japan

Helping with Construction of Group Companies Outside Japan's Purchasing System

When NGK Ceramics (Thailand) was starting up, we helped it put in place a purchasing system.

Members of the Purchasing Department were sent to Thailand, where they worked with local management and purchasing staff members to develop purchasing compliance and governance procedures tailored to local conditions and to then construct a purchasing system.

We will continue to support local management and purchasing staff via activities that improve local purchasing capabilities, such as procurement task streamlining, client management, and buyer up-skilling training.

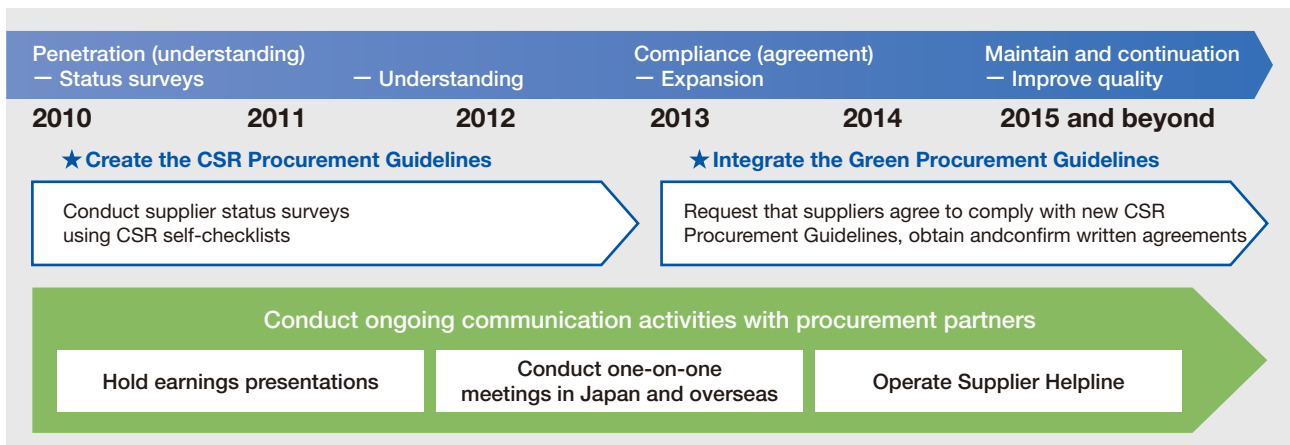
Conducting Logistics Liaison Meetings

We invited the logistics representatives from NGK Ceramics Polska (Poland) to the NGK headquarters in Japan to participate in an information exchange meeting.

Topics of discussion included the two companies' logistics-related challenges, cases of improvement, and requests and expectations of one another. Afterwards, the representatives were taken to visit warehouses, airports, harbors, and other logistics sites.

The importance of logistics between NGK in Japan and NGK Ceramics Polska has grown as product shipments from NGK Ceramics Polska continue to rapidly expand, and it is in this context that our two companies have strengthened their communication, gleaned key insights from one another which have helped foster more efficient operations.

Ongoing Promotion of CSR Procurement



Supply Chain Risk Assessment

In order to identify sustainability-related risks in the supply chain, the NGK Group relies upon the CSR Procurement Guidelines in selecting procurement partners as well as visits suppliers.

Communication Activities with Procurement Partners

Earnings Presentations for Suppliers

NGK held an earnings presentation meeting for major suppliers in June 2018, which was attended by 234 participants from 127 companies.

In the meeting, the director in charge of purchasing first expressed gratitude for the daily transactions. This was followed by the Finance & Accounting Department's briefing on NGK's business results and an explanation by the Purchasing Department about efforts to tackle issues such as continuous communication.



Suppliers invited to the earnings presentation

Ongoing Operation of the Supplier Helpline

In 2008, NGK established the supplier helpline system. Receiving consultation via e-mail, fax, and telephone, we make an effort to respond with solutions quickly.

Reference
URL

Supplier Helpline

<https://www.ngk-insulators.com/en/info/procure/>

Visiting Individual Suppliers in Japan and Overseas

In order to ensure procurement from the most appropriate suppliers, NGK visits individual suppliers in Japan and overseas to conduct on-site audits, evaluating their QCD (quality, cost, and delivery) performance in a fair and equitable manner. In fiscal 2018, we visited a total of 127 suppliers: 12 new suppliers and 115 existing suppliers.

Following the visit, we explained audit results to each company, and asked them to conduct improvement measures in underperforming areas. Through these activities, we strive to strengthen our QCD management system as well as to communicate with our suppliers to forge a relationship of mutual trust.

Local Communities

The NGK Group is concerned about social issues in all nations and regions. We engage in social contribution activities in response to needs in each region in an aim to become a corporate citizen trusted by local communities.

Basic Approach

The NGK Group promotes social contribution activities based on the following concepts.

Focus of Activities
Centered on people and education, the environment, and community involvement.

Company Activities and Employee Involvement

- NGK provides employees with opportunities to experience activities.
- NGK proactively encourages individual activities to engender employee satisfaction and a sense of confidence in the company.

Information Disclosure
NGK promotes an understanding of activities and provides activity information to inculcate a social contribution mindset among employees.

Social Contribution Activity Promotion System

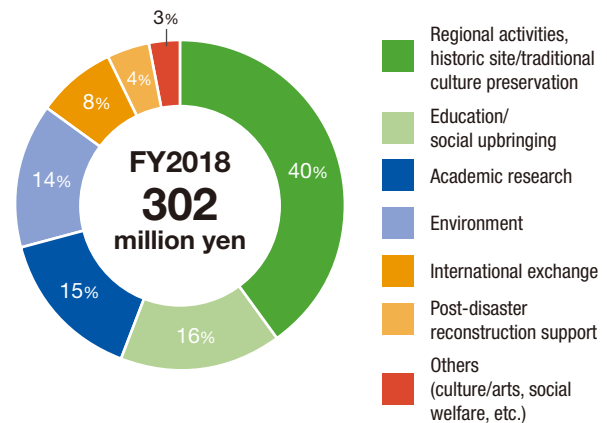
At the NGK Group, social contribution activities are promoted under the leadership of the Social Contribution Subcommittee, which is chaired by the general manager of the General Affairs Department and reports to the CSR

Committee. NGK collects reports from Group companies in and outside of Japan on their activities. In fiscal 2018, a total of 61 reports were received.

Social Contribution Activity Promotion Status

	FY2014	FY2015	FY2016	FY2017	FY2018
Social contribution expenditures	331 million yen	346 million yen	315 million yen	300 million yen	302 million yen
Number of social contribution programs	8	9	10	10	10
Number of collaborations with NPOs/NGOs	5	4	4	4	4

Breakdown of Activities



Providing Scholarships and Assistance to International Students

NGK established the NGK Foundation for International Students in order to facilitate the cultivation of individuals who will contribute to the development of the international community. It is through the Foundation that NGK is helping to provide housing and scholarships to overseas students visiting Japan.

The impetus for the Foundation's establishment stems from gratitude for the warm community support and hospitality shown to NGK's first employees and families posted overseas at the time of its initial overseas expansion back in the 1930s. Our activities are conducted in the hope that the students will feel glad that they came to Japan and develop a fondness for the country.

In fiscal 2018, we provided housing to 39 students from 11 countries, and scholarships (non-repayable) to 19 students from 12 countries.



Reference URL
The NGK Foundation for International Students
<https://www.ngk-insulators.com/en/sustainability/philanthropy/>

Exchange between Supported Students, Communities, and Employees

NGK organizes a variety of events and programs to provide opportunities for grassroots international relations between supported students, regional communities, and employees. Language classes taught by international students have been held annually since 2000, and cross-cultural exchange meetings where international students introduce their native countries have been held annually since 2006.

In fiscal 2018, there were eight cross-cultural exchange meetings alternately hosted by different exchange students to introduce their different home countries. Through these events, participating students and local residents were able to enjoy meaningful exchange. As of fiscal 2018, a cumulative total of 980 people have participated.

Number of Participants in International Programs

International students	12
Local residents	20

Communication after Support Ends

To maintain relationships with international students after support ends, each year, we send out a New Year's greeting card that includes a company status report to former and current students.

We also distribute NGK International Friendship Club Members Cards that include our contact information to international students after support ends.

In fiscal 2018, we sent New Year's cards with updates on the Foundation and NGK to around 300 students who have received support in the past.

Social Contribution Activities in Collaboration with Local Communities and NPOs

Aiming to be a corporate citizen trusted by local communities, NGK collaborates with communities and NPOs to engage in social contribution activities in response to regional needs. In addition, employee volunteers from NGK Group companies in Japan and around the world conduct a variety of social contribution activities rooted in their local communities.

Reference
URL

Read more about NGK's social contribution activities at:

<https://www.ngk.co.jp/sustainability/social/>

Social Contribution Activities by NGK

Offering Workplace Experience to Junior High School Students from Rikuzentakata City

NGK took part in the workplace experience program offered to junior high school students from Rikuzentakata City, sponsored by the Nagoya City Board of Education.

Two Rikuzentakata junior high-school students visited the AC Plant and looked at factory operations such as the loading of HONEYCERAM® products into kilns. They spoke with President Oshima about their impressions of the workplace and their future aspirations.

This program is conducted in line with the “total support” initiatives that Nagoya City undertakes towards Rikuzentakata City, which suffered immense damage as a result of the Great East Japan Earthquake. NGK has taken part in this program each year since 2016.



Participation in Lunch Service

NGK employees took part as volunteers in a community lunch event held at Mitsurugi Community Center (Mizuho Ward, Nagoya City) for elderly citizens who live alone. This community lunch is a regularly scheduled event of the Mizuho Ward School District Community Social Welfare Council, and NGK has taken part in it every year for the past 22 years.



Social Contribution Activities by Group Companies in Japan

NGK Electronics Devices Volunteers in Mine Cherry Blossom Festival

For the first time, NGK Electronics Devices employees took part as volunteers in the Mine Cherry Blossom Festival.

This was the 31st occasion of this popular festival, held beneath the blossoms of the cherry trees that line the Asa River adjacent to Mine City Hall. The volunteers from NGK Electronics Devices helped out by setting up parking signs, answering visitors' questions, cleaning up venue spaces, and in other ways.



Soshin Electric Helps with Placing Flower Pots at Sakudaira Station

Soshin Electric provided help with placing “Welcome” flower pots at JR Sakudaira Station.

This was the third year for this annual project overseen by the Saku City Tourism Association and Sakudaira General Technical High School.

This year’s installation was arranged with the help of staff members from the tourism association, 30 fourth graders from Sakudaira Asama Elementary School who planted the seeds, and 10 students from Sakudaira General Technical High School who cultivated the flowers.



Soshin Powertech Participates in Evacuation Drill at Aged Care Facility

Two employees of Soshin Powertech, which is part of the Soshin Electric Group, assisted with an evacuation drill held at a local support center for senior citizens. This evacuation drill is held once every six months and is assisted by local residents, businesses, and public groups. Soshin Powertech takes part every year as part of its community contribution activities.



NGK Ceramic Device Gives Donations for Victims of the 2018 West Japan Floods

The NGK Ceramic Device employees’ association, the Gotanda-kai, raised 300,000 yen in total from employees at the head office, Yamanashi plant, and Ishikawa plant. They donated this money to support the victims of the flooding that occurred in western Japan in July 2018 following a series of heavy storms. The thoughts of everyone in the NGK Group are with the victims and the affected communities, and we pray for their speedy recovery.



NGK Okhotsk Helps with Asian Skunk Cabbage Habitat Conservation Efforts

NGK Okhotsk (NOK) took part in the Asian skunk cabbage conservation efforts conducted by the Lake Abashiri Mizu-to-Midori-no-Kai (Water and Greenery Association).

These activities are performed twice a year in the spring and summer in order to preserve the scenic beauty and environmental health of the roughly 5,000 m² Asian skunk cabbage wetland habitat around Lake Abashiri. This is the ninth year that NOK has participated, and the company cooperates with the residents of Abashiri City to preserve the health of the local natural environment.



Social Contribution Activities by Group Companies Outside Japan

NGK Globetronics Technology Donates Blood

NGK Globetronics Technology (NGKGT), one of the overseas production bases of NGK Electronics Devices, held a company blood drive.

NGKGT staff have been donating blood once a year for 20 years as a part of its activities to give back to the community.



NGK Metals Contributes to Urban Beautification

Employee volunteers from NGK Metals helped with the maintenance of flower beds in Monroe County in the State of Tennessee, where the company is located.

The volunteers mowed the grass around the flower beds and replanted flowers. They will continue to perform regular cleaning and maintenance and, together with the community, watch over the growth of new flowers and plants as part of their ongoing contribution to the beautification of the local urban area.



NGK Technocera Suzhou Undertakes Cleanup Activities during Employee Trip

During an employee trip, employees of NGK Technocera Suzhou undertook cleanup activities at the Five Dragons Pool, one of the famous landmarks in Ningbo City, Zhejiang Province, to help preserve the site's scenic beauty. This was the first employee trip to incorporate cleanup activities, and the company will continue with similar activities in the future to serve the community.



NGK Electronics Devices Malaysia Cleans Up Local Area

NGK Electronics Devices Malaysia (NGKMY), an overseas production base of NGK Electronics Devices, held a cleanup event. This was the first such activity that NGKMY had organized as a means of fostering greater civic-mindedness among employees and for which the cooperation of Penang City Hall was requested.

The theme was "Protecting Our Earth," and participants picked up litter around KOMTAR* Tower, the tallest building in Penang.



*Acronym for "Kompleks Tun Abdul Razak"

Support for Volunteer Activities by Employees

The NGK Group proactively supports activities and provides information to create opportunities for employees to participate in volunteering outside the company.

Volunteering to Teach Children About the Wonders of Science

As a manufacturer, NGK engages in various activities to spark children's interest in science. In 1997, we started running the "NGK Science Site: Experiments at Home Series" as a regular feature in a science magazine. We also maintain a dedicated website which is updated monthly.

Children's interest is piqued through the use of featured experiments that are supervised by experts and which address interesting and relevant topics. These experiments utilize familiar, everyday materials like plastic bottles, dry cell batteries, vegetables, and condiments and are explained in detailed steps.

Since 1998, the experiments introduced on the NGK Science Site have been demonstrated at the Youngsters' Science Festival in Nagoya (hosted by the Japan Science Foundation) and other local science events. Every year, NGK employee volunteers set up a booth to present a science lab.



Reference URL **NGK Science Site**
<https://site.ngk.co.jp/>

Christmas Lectures Convey the Wonders of Science

Since 2011, NGK has been involved in the Royal Institution Christmas Lecture (sponsored by the Yomiuri Shimbun news corporation and the Tokyo Institute of Technology), which is an annual event aimed at conveying the wonders of science to children. This popular series of lectures began in the U.K. around 200 years ago and serves as a "Christmas present" from scientists to young people. This format has been replicated in Japan, and each year NGK employees take part as guest lecturers who provide an easy-to-understand explanation to children and students about NGK products that fit that year's theme.



Group Volunteer Participation in the Marathon Festival Nagoya Aichi 2019

The NGK Group took part as group volunteers in the Marathon Festival Nagoya Aichi 2019 on March 10.

For the past five years the NGK Group has taken part as volunteers, and this year, too, we helped with the main race by distributing water to runners, assisting with course arrangement, and in a variety of other ways.



Interacting with Local Communities

The NGK Group engages in dynamic interactions with local residents through opportunities such as plant tours and regional events, as well as through opportunities for direct dialogue, making an effort to incorporate the ideas and opinions received in Group business activities and CSR activities.

Plant Tours

Plant Tours in FY2018 (NGK)

	Participants	Details
Nagoya Site	31	NGK Foundation for International Students
	28	Aichi Prefectural Jishukan Senior High School
	3	Rikuzentakata City Takada Daiichi Junior High School
Chita Site	53	Local resident plant tour group
Komaki Site	3	Aichi Prefecture Kasugai-nishi Senior High School
	13	Neighborhood ward tour
Ishikawa Plant	41	Ishikawa Technical Senior High School
	5	Toyohashi University of Technology

Plant Tours by Major Group Companies

	Participants	Details
NGK Electronics Devices	23	Yamaguchi University
	31	Mine City Ohmine Junior High School
	38	Mine Seiryō High School
	34	Onoda Technical High School
Soshin Electric	29	PTA of community near Soshin Electric Chikuma Technical Center (Saku, Nagano Prefecture)
Soshin Powertech	3	Yamanoguchi Junior High School
Soshin Device	40	Miyazaki Technical High School

TOPIC

Summer Festivals at the Komaki Site and Ishikawa Plant

The Komaki Site hosted its annual Komaki Summer Festival, which was attended by local residents, employees, and their families.

Attendees were attracted to the specially constructed stage where they enjoyed taiko drumming, exciting science experiments, and vocal performances. The crowd was also full of anticipation and excitement for the raffle, which was held at the end of the festival.

The Ishikawa Plant also held their NGK Ishikawa Plant Summer Festival 2018, which drew around 850 local residents, employees, and their families. A specially constructed stage was set up to showcase the enthusiastic dance routines of local dance teams and performances by singers and idol groups from Ishikawa, all to the great delight of the attendees. And when it was time for the raffle, the crowd was gripped with excitement at the sight of the lavish prizes to be given away.



Komaki Summer Festival



NGK Ishikawa Plant Summer Festival 2018

Governance

NGK Sustainability Data Book 2019

Governance

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Corporate Governance

NGK is conducting measures to expand and strengthen its corporate governance to increase corporate value with the intent of becoming a company trusted by all its stakeholders.

Reference
URL

Corporate Governance Report

https://www.ngk-insulators.com/en/resource/pdf/sustainability/governance_en.pdf

Basic Policies

Thorough observance of the NGK Group Code of Conduct

To ensure appropriate operations and transparent management, NGK has set its sights on establishing and maintaining an organization capable of swiftly responding to changes in the business environment, and a fair and open management system emphasizing the interests of shareholders. These components make up NGK's basic approach to corporate governance.

To put this approach into practice, NGK has chosen a corporate governance structure anchored by an Audit & Supervisory Board. In addition to the General Meeting of Shareholders, the Board of Directors, and the Audit & Supervisory Board, NGK corporate governance includes the Executive Committee and several other committees established to assist the president in management decision-making. These bodies help to enhance governance efficacy by deliberating and reviewing important matters. In recognition of needs to execute swift and optimal decision-making and respond promptly to changes in the operating environment, NGK introduced an executive officer system, thus separating the management decision-making and supervision functions from business execution functions, and clearly defining the responsibilities of both.

Furthermore, to strengthen the supervision and monitoring functions of the Board of Directors, major committees among those tasked with mitigating the various risks surrounding NGK are obligated to report to the Board of Directors. NGK has also established a committee scheme, including a Nomination and Compensation Advisory Committee, a Corporate Council, a Conference of Outside Directors and Outside Audit & Supervisory Board Members, and a Business Ethics Committee to ensure the effectiveness of the Corporate Governance Code.

In addition, we have formulated the NGK Group Code of Conduct to stipulate how everyone working for the NGK Group should execute their jobs so that they abide by society's laws and the company's articles of incorporation and comply with corporate ethics. All executives and employees are well versed in the code and are obligated to abide by it. To reflect changes in society since the previous revision, in January 2019 the NGK Group Code of Conduct was revised with an emphasis on respect for human rights, thorough compliance, and the realization of a sustainable society through business activities.

Corporate governance enhancement

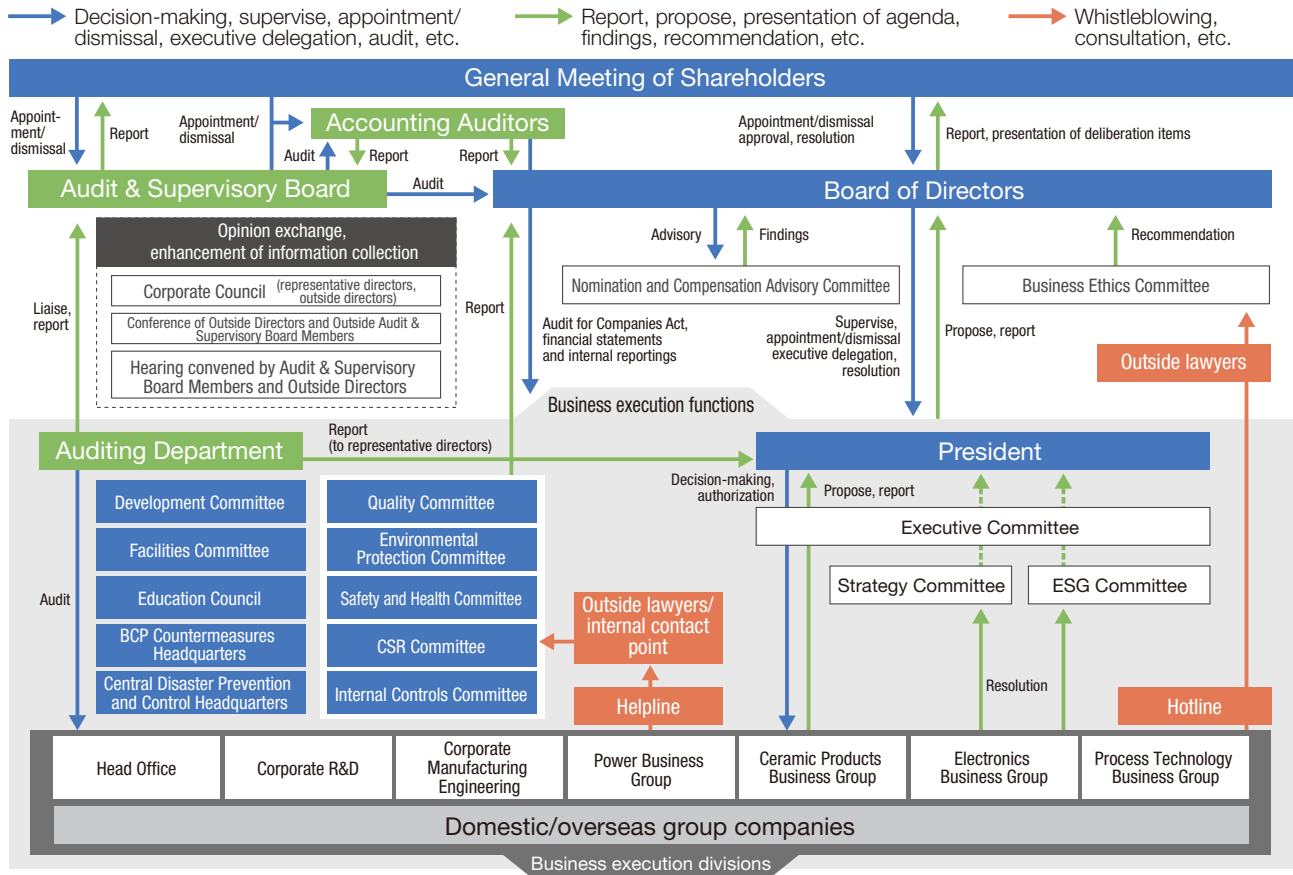
Ongoing structural enhancements aimed at strengthening corporate governance include the introduction of an executive officer system and an outside director system to improve the management supervision and monitoring functions and facilitate recommendations with respect to overall management.

April 1999	Formulated NGK Code of Conduct
April 2003	Revised guidelines into NGK Group Code of Conduct
June 2005	Introduced an executive officer system
	Introduced a stock option
	Introduced an outside director system
July 2005	Established the CSR Committee
April 2007	Established the CSR Office
June 2010	Appointed independent directors
July 2011	Revised NGK Group Code of Conduct
April 2015	Signed on to UN Global Compact
June 2015	Established the Global Compliance Office
December 2015	Established committees for corporate governance
June 2017	Appointed one additional outside director
October 2018	Appointed a chief compliance officer
January 2019	Revised NGK Group Code of Conduct

Corporate Governance Structure Scheme

To ensure lawful business activities and management transparency, respond quickly to changes in the management environment, and create and maintain a fair management system from the shareholder's perspective, NGK has created the following systems. In April 2019, we

established the ESG Committee, chaired by the president, to promote comprehensive discussion on key issues, strategies, and action plans related to the environment, society, and governance.



Committees on Corporate Governance

NGK has further strengthened and enhanced its corporate governance structures by establishing committees to bolster the supervision and monitoring functions of the Board of Directors.

Board of Directors

The Board of Directors deliberates matters prescribed in the Companies Act, as well as other important management issues, providing oversight for the execution of duties by directors. The Board of Directors includes three outside directors to create a system enabling management monitoring based on professional knowledge and decision-making from a wider perspective. As of June 21, 2019 the current Board of Directors comprises 12 members (11 men and one woman).

Times held: 14

Audit & Supervisory Board

The Audit & Supervisory Board consists of four members, each of whom attends Board of Directors meetings and conducts other activities to audit the execution of duties by directors. The Audit & Supervisory Board includes two external members, each possessing significant business experience and extensive insight. The Audit & Supervisory Board members, including these highly independent outside members, conduct audits on the execution of duties by directors, business operations, and the company's financial position.

Times held: 14

Executive Committee

Comprising the president, directors, Audit & Supervisory Board members, and executive officers and division heads designated by the president, this body deliberates the matters necessary to help the president with decision-making. As of June 21, 2019, the current Executive Committee comprises 16 members (15 men and one woman).

Times held: 21

Business Ethics Committee

Comprised of five outside directors and one internal director responsible for compliance, this committee monitors for fraud or illegalities involving senior management, as well as for compliance with the Competition Law and the Foreign Corrupt Practices Act, and reports directly to the Board of Directors. As a mechanism to prevent fraud or legal violations, in addition to the Helpline, an internal reporting system (Hotline) linked directly to outside lawyers was established with the aim of strengthening NGK's compliance structure.

Times held: 8

Nomination and Compensation Advisory Committee

Comprising five outside directors and three representative directors, this committee deliberates on matters related to the appointment of directors and Audit & Supervisory Board members, remuneration of directors, executive officers, and Audit & Supervisory Board members, and Chief Executive Officer succession planning. The results of these deliberations are reported to the Board of Directors in attempts to ensure fairness and increase transparency related to determining the appointment and remuneration of officers.

Times held: 5

Corporate Council

The meeting enables outside directors to exchange opinions with representative directors and others when proactive recommendations for senior management are sought from outside directors regarding various management-related issues.

Times held: 2

Conference of Outside Directors and Outside Audit & Supervisory Board Members

Comprised exclusively of outside directors, these meetings facilitate an exchange of opinions regarding NGK management issues, with the intent of proactively contributing to discussions at Board of Directors meetings.

Times held: 1

Hearing convened by Audit & Supervisory Board Members and Outside Directors

Comprised of Audit & Supervisory Board members and outside directors, these hearings gather information from internal sources regarding the business environment and issues surrounding NGK.

Times held: 9

Note: Times held is the number of meetings between April 2018 and March 31, 2019.

Bodies Concerning Observance of Laws, Regulations, and Corporate Ethics

Quality Committee	<p>Aiming to increase customer satisfaction and trust by realizing even higher-quality products and services, this body deliberates the matters necessary to help the president and the Quality Committee Chair with decision-making regarding the following items.</p> <ol style="list-style-type: none"> 1. Determination and revision or abolition of Quality Policy and Objectives 2. Items pertaining to the prevention of serious quality defects in the market and technological responses after occurrence 3. Other quality-related matters determined to be important
Environmental Protection Committee	<p>This body formulates and deliberates the planning of matters necessary to help the president and the Environmental Protection Committee Chair with decision-making regarding the realization of our Core Policy on the Environment to promote business activities in harmony with the environment.</p>
Safety and Health Committee	<p>This body deliberates important issues on safety and health to assist the decision-making of the president and Safety and Health Committee Chair regarding the establishment of basic policies and priority targets pertaining to safety and health and the confirmation of labor accidents and priority activities.</p>
CSR Committee	<p>This body assists the president and CSR Committee Chair with decision-making by deliberating matters necessary for the observance of laws, regulations, and corporate ethics.</p> <p>Observance of Laws, Regulations, and Corporate Ethics</p> <ol style="list-style-type: none"> 1. Determination and revision or abolition of basic policies related to the observance of laws, regulations, and corporate ethics, including the Code of Conduct 2. Determination of systems, structures, and strict observance of important activities pertaining to laws, regulations, and corporate ethics company-wide 3. Determination, revision, or abolition of risk management structures pertaining to laws, regulations, and corporate ethics. <p>Additionally, responses to items determined to pose a significant threat to the company among other matters, incidents or accidents related to laws, regulations or corporate ethics, as well as consideration and evaluation of the projects promoted by each subcommittee and other CSR-related items identified as important by the CSR Committee Chair, are also deliberated.</p> <p>Times held: 3 times a year</p>
Internal Controls Committee	<p>This body deliberates matters necessary to help the president and Internal Controls Committee Chair with decision-making regarding internal controls system assessment and reporting related to financial reporting based on the Financial Instruments and Exchange Act.</p> <ol style="list-style-type: none"> 1. Determines the scope of reporting for each fiscal year, assessment and reporting schedules, standards to assess internal controls, and other basic matters 2. Summarizes internal controls assessment and drafts internal controls report <p>Times held: 3 times a year</p>
Development Committee	<p>This body deliberates items necessary to assist the decision-making of the president and Development Committee Chair regarding policies, evaluations, budgets, major individual planning, and commercialization projects related to development.</p>
Facilities Committee	<p>This body deliberates items necessary to assist the decision-making of the president and Facilities Committee Chair regarding the examination and evaluation of policies, budgets, performance, and major individual planning related to capital expenditure and information systems.</p>
Education Council	<p>This body deliberates items necessary to assist the president's decision-making regarding policies, systems, structures, and major promotion programs related to human resource development.</p>
BCP Countermeasures Headquarters	<p>Aimed at ensuring business continuity in times of emergency, this body executes the operation and maintenance of business continuity planning (BCP) in normal times as well as gives instructions on and support to restoration systems, and prioritizes restoration orders when BCP is in effect.</p>
Central Disaster Prevention and Control Headquarters	<p>This body executes requisite duties under commands from the Head and deliberates items necessary to assist the decision-making of the president and Head of this body regarding items related to earthquakes, storm and flood damage, fires, and explosions that threaten or significantly impact the company.</p>
Security Export Control/ Specified Export and Customs Clearance Control Committee	<p>This body deliberates and determines items necessary for guidance for subsidiaries and affiliates, legal compliance and the improvement of other internal systems with respect to security export controls, specified export declaration systems, and the management of customs clearance operations.</p>

Business Execution Status

Regarding business execution based on the Board of Directors resolutions, the president presides over company business as the chief executive of business execution. The Executive Committee holds discussions to assist the president's decision-making with respect to important matters regarding business execution. In addition, the Board of Directors is asked for proactive recommendations for management by outside directors pertaining to management-related issues at the Corporate Council, which facilitates an exchange of opinions between outside directors and representative directors.

Monitoring Status

In line with audit policies and plans defined by the Audit & Supervisory Board, Audit & Supervisory Board members make an effort to collect information through hearings convened by Audit & Supervisory Board members and outside directors, in an attempt to communicate with directors and employees while monitoring director business execution by attending Board of Directors and Executive Committee meetings. At Audit & Supervisory Board meetings attended by outside Audit & Supervisory Board members, the members exchange information with accounting auditors and the Internal Auditing Department in an attempt to facilitate mutual cooperation.

Election of Board Members, Executive Officers, and Audit & Supervisory Board Members

With respect to the nomination of candidates for the Board of Directors and Audit & Supervisory Board, all representative directors discuss matters related to each candidate. The Nomination and Compensation Advisory Committee, of which external directors make up a majority, then deliberates matters related to each candidate, and reports the results to the Board of Directors. As for candidates for the Audit & Supervisory Board, approval is obtained from the Audit & Supervisory Board in order to secure the independence of Audit & Supervisory Board members. With consideration given to the report made by the Nomination and Compensation Advisory Committee, candidates for the Board of Directors and Audit & Supervisory Board are determined by resolution of the Board of Directors and their confirmation is set as an agenda item for the General Meeting of Shareholders. Members of the Board of Directors and Audit & Supervisory Board are then appointed by resolution of the General Meeting of Shareholders. Also, to further clarify the directors' mission and responsibilities, the term of office for directors is one year.

Training Policies for Executives

Newly appointed directors and executive officers are provided with training conducted by attorneys practicing in the United States and Japan related to the Companies Act and the Competition Law, conducted at the time of their appointment. In addition, each year lectures are held, targeting all directors and executive officers, related to compliance with the Competition Law, focused on the expanding scope of Competition Law enforcement and practical business risks. In addition, with regard to outside directors, we provide regular opportunities for the provision of individual explanations by personnel from relevant business divisions concerning mainly proposals presented to the Board of Directors meeting as well as information and exchange of opinions pertaining to business environment and related issues.

Evaluation on the Effectiveness of the Board of Directors

With regard to its effectiveness, the Board of Directors issues a survey at the end of every fiscal year to directors and Audit & Supervisory Board Members. The results are reported at the Board of Directors' meeting, after the analysis and evaluation by an external organization, and NGK implements specific initiatives to enhance the effectiveness of the Board of Directors based on issues identified in the results of this evaluation.

In the evaluation of the Board of Directors conducted in fiscal 2018, the external organization found that foundational elements required of the Board of Directors have been established, such as the leadership of the Chairman of the Board of Directors, the commitment of its members, and its sound culture and operation, as well as that the Board of Directors are making continuous improvements and recognizes issues toward further progress. Accordingly, the external organization judged that the Board of Director possesses sufficient effectiveness. On the other hand, it was pointed out that further efforts to improve effectiveness by considering specific measures would be desirable, based on opinions from some members that there was room for improvement in areas such as the understanding of risks for important, large-scale projects, analysis of the reasons behind past management decisions, and the treatment and development of senior managers in key business departments. Based on the results of this evaluation, NGK will continue endeavoring to maintain and strengthen the effectiveness of the Board of Directors, including implementing specific measures suited to actual circumstances at the Company.

Policy on Cross-Shareholdings

NGK holds shares of listed companies which contribute to the NGK Group's long-term business development as cross-shareholdings, primarily in order to maintain and strengthen business relationships. In addition, NGK holds the shares of each company in the Morimura Group, which was established by the same founders of NGK, for the mutual benefit of enhancing management quality, as the Morimura Group brand forms a part of NGK's corporate value through its philosophy and heritage. As all cross-shareholdings are a part of the asset portfolio, they are positioned as assets to supplement the amount of liquidity considered necessary in the business plan. NGK constantly strives to reduce the scale of cross-shareholdings from the perspective of capital efficiency. Furthermore, the scale of cross-shareholdings may fluctuate due to factors including changes in overall business trends and risks, financial conditions, and the status of NGK's business relationship with each business partner. Regarding the specific stocks held, at its Board of Directors' meeting, NGK regularly reviews the appropriateness of the continuous holding of shares as cross-shareholdings along with the capital policy, by determining the significance of holding from the business relationship, the safety of ratings and so forth, and the efficiency of dividend yields and so forth. On the other hand, when comparing cross-shareholdings to NGK's cost of capital, evaluations based solely on shares are not conducted. Instead, ROIC management is conducted for each business with differing risks and expected returns, and cross-shareholdings are evaluated after being included in each business's balance sheet.

Board of Directors, Audit & Supervisory Board, Executive Officers

Board of Directors (as of June 30, 2019)



Taku Oshima
President

Attendance at Board of Directors meetings

14/14

March 1980 Joins NGK
June 2007 Appointed as vice president
June 2011 Appointed as senior vice president
June 2014 Appointed as president (incumbent)



Yukihiisa Takeuchi
Executive Vice President

Attendance at Board of Directors meetings

14/14

March 1978 Joins NGK
June 2004 Appointed as director
June 2005 Appointed as vice president
June 2008 Appointed as senior vice president
June 2011 Appointed as director and senior vice president
June 2015 Appointed as executive vice president (incumbent)

Group Executive, Corporate R&D; Development Committee Chair



Hiroshi Kanie
Executive Vice President

Attendance at Board of Directors meetings

14/14

March 1981 Joins NGK
June 2010 Appointed as vice president
June 2012 Appointed as senior vice president
June 2014 Appointed as director and senior vice president
June 2018 Appointed as executive vice president (incumbent)

Responsible for Corporate Planning Office, New Business Planning Office, Secretarial Office, Corporate Communications Dept., Human Resources Dept., General Affairs Dept., and Power Business Group; Senior Officer in Charge of Group Companies; General Manager, Osaka Branch; in charge of overall personal information management, privacy protection, and Construction Business Act compliance



Susumu Sakabe
Director and Senior Vice President

Attendance at Board of Directors meetings

14/14

March 1981 Joins NGK
June 2007 Appointed as vice president
June 2010 Appointed as director and executive officer
June 2011 Appointed as director and senior vice president (incumbent)

Responsible for Finance & Accounting Dept. and Purchasing Dept.; General Manager, Tokyo Main Office



Ryohei Iwasaki
Director and Senior Vice President

Attendance at Board of Directors meetings

14/14

March 1982 Joins NGK
June 2008 Appointed as vice president
June 2009 Appointed as director and executive officer
June 2012 Appointed as director and senior vice president (incumbent)

Group Executive, Process Technology Business Group; in charge of management affairs



Chiaki Niwa
Director and Senior Vice President

Attendance at Board of Directors meetings

13/14

March 1984 Joins NGK
June 2013 Appointed as vice president
June 2015 Appointed as director and executive officer
June 2016 Appointed as director and senior vice president (incumbent)

Group Executive, Corporate Manufacturing Engineering; responsible for Quality Management Dept., Environmental Management Dept., and Safety and Industrial Health Management Dept; Facilities Committee Chair, Quality Committee Chair, Environmental Committee Chair, and Safety and Industrial Health Committee Chair



Shuhei Ishikawa
Director and Senior Vice President

Attendance at Board of Directors meetings

14/14

March 1984 Joins NGK
June 2010 Appointed as vice president
June 2014 Appointed as senior vice president
June 2015 Appointed as director and senior vice president (incumbent)

Group Executive, Electronics Business Group



Nobumitsu Saji
Director and Senior Vice President

Attendance at Board of Directors meetings

14/14

March 1984 Joins NGK
June 2013 Appointed as vice president
June 2014 Appointed as director and executive officer
June 2015 Appointed as director and senior vice president (incumbent)

Chief Compliance Officer; responsible for Auditing Dept., Group Compliance Dept., Legal Dept., and Intellectual Property Dept.; Chair of CSR Committee and Internal Controls Committee; in charge of company-wide Competition Law compliance; Data Protection Officer



Atsushi Matsuda
Director and Senior Vice President

Attendance at Board of Directors meetings

10/10

Note: Since being appointed to current post in June 2018

March 1985 Joins NGK
June 2012 Appointed as vice president
June 2017 Appointed as senior vice president
June 2018 Appointed as director and senior vice president (incumbent)

Group Executive, Ceramic Products Business Group; General Manager, Global Sales & Marketing Div., Ceramic Products Business Group; General Manager, Nagoya Site



Independent Director
Hiroyuki Kamano
Outside Director

Attendance at Board of Directors meetings
13/14

Apr. 1971 Joins Ministry of Foreign Affairs
Apr. 1979 Trains at Legal Training and Research Institute, Supreme Court of Japan
Apr. 1981 Becomes registered attorney
Oct. 1988 Becomes representative attorney, Kamano Sogo Law Offices (incumbent)
June 2007 Appointed as outside auditor, Komatsu Ltd.
July 2007 Appointed as outside director, Sumitomo Life Insurance Company
Apr. 2009 Appointed as vice president, Tokyo Bar Association
June 2011 Appointed as director, NGK (incumbent)
June 2015 Appointed as outside auditor, House Foods Group Inc. (incumbent)



Independent Director
Emiko Hamada
Outside Director

Attendance at Board of Directors meetings
14/14

Apr. 1984 Joins Taiyo Yuden Co., Ltd.
Dec. 2001 Appointed as general manager, Quality Assurance Control R Technology Div., Engineering Group, Taiyo Yuden
Sept. 2003 Appointed as chief engineer, Basic Research Div., General Research Laboratory, Engineering Group, Taiyo Yuden
Nov. 2008 Appointed as associate professor, Center for Social Contribution and Collaboration, Nagoya Institute of Technology (NITech)
Apr. 2011 Appointed as professor, Center for Social Contribution and Collaboration, NITech, and professor for Master of Techno-Business Administration, NITech Graduate School
Apr. 2012 Appointed as professor, Center for Research on Assistive Technology for Building a New Community, NITech
May 2015 Appointed as third-area program officer, A-STEP (Adaptable and Seamless Technology Transfer Program through Target-driven R&D), Japan Science and Technology Agency (incumbent)
July 2016 Appointed as part-time lecturer, NITech (incumbent)
Aug. 2016 Appointed as visiting professor, Nagoya University (incumbent)
June 2017 Appointed as director, NGK (incumbent)
June 2019 Appointed as outside director, Taiyo Yuden (incumbent)



Independent Director
Kazuo Furukawa
Outside Director

Attendance at Board of Directors meetings
Newly appointed

Apr. 1971 Joins Hitachi, Ltd.
Apr. 2005 Appointed as representative executive officer, executive vice president, and executive officer; general manager and CEO, Information & Telecommunications Group; general manager, Export Control Div.; Hitachi
Apr. 2006 Appointed as representative executive officer and president, Hitachi
June 2006 Appointed as director, representative executive officer, and president, Hitachi
May 2007 Appointed as vice chair, Keidanren (Japan Business Federation)
Apr. 2009 Appointed as director, representative executive officer, and vice chair, Hitachi
June 2009 Appointed as special advisor, Hitachi
June 2011 Appointed as president, Information Processing Society of Japan
Oct. 2011 Appointed as chair, New Energy and Industrial Technology Development Organization
June 2019 Appointed as director, NGK (incumbent)

Audit & Supervisory Board (as of June 30, 2019)



Ken Sugiyama
Audit & Supervisory Board Member

Attendance at Board of Directors meetings
14/14
Attendance at Audit & Supervisory Board meetings
14/14

Mar. 1980 Joins NGK
July 2002 Appointed as general manager, Finance Dept.
Apr. 2007 Appointed as general manager, Auditing Dept.
June 2015 Appointed as Audit & Supervisory Board member (incumbent)



Takeshi Shimazaki
Audit & Supervisory Board Member

Attendance at Board of Directors meetings
Newly appointed
Attendance at Audit & Supervisory Board meetings
Newly appointed

Mar. 1982 Joins NGK
Apr. 2010 Appointed as manager, Finance Dept.
June 2015 Appointed as general manager, Auditing Dept.
June 2019 Appointed as Audit & Supervisory Board member (incumbent)

Executive Officers (as of June 30, 2019)

Shigeru Kobayashi
Senior Vice President
Group Executive, Power Business Group; General Manager, Komaki Site

Hiroshi Kurachi
Senior Vice President
General Manager, Sensor Div., Ceramic Products Business Group

Takaya Teshima
Senior Vice President
Group Vice Executive, Process Technology Business Group

Hiroto Matsuda
Senior Vice President
General Manager, High Performance Ceramics Div., Process Technology Business Group

Tadaaki Yamada
Senior Vice President
General Manager, Human Resources Dept.; in charge of General Affairs Dept.

Tsutomu Nanataki
Senior Vice President
Group Vice Executive, Corporate R&D; Project Leader, Functional Materials Development Project, Corporate R&D

Tomohiro Yamada Vice President
President, NGK Electronics Devices Inc.

Akira Katoh Vice President
General Manager, New Metals Div., Electronics Business Group; General Manager, Chita Site

Masanobu Inoue Vice President
General Manager, Industrial Process Div., Process Technology Business Group

Hiroharu Kato Vice President
President, NGK Europe GmbH

Atsushi Miyajima Vice President
General Manager, Manufacturing Engineering Div., Corporate Manufacturing Engineering Group

Hideaki Shindo Vice President
General Manager, Finance Dept.

Jun Mori Vice President
General Manager, Manufacturing Div., Ceramic Products Business Group

Hiroyuki Shinohara Vice President
General Manager, Corporate Planning Office

Iwao Ohwada Vice President
General Manager, Advanced Device Components Div., Electronics Business Group



Independent Director
Junichi Itoh
Audit & Supervisory Board Member, Outside

Attendance at Board of Directors meetings
10/10
Attendance at Audit & Supervisory Board meetings
10/10
Note: Since being appointed to current post in June 2018

Apr. 1975 Joins Mitsubishi Bank (now MUFG Bank)
June 2002 Appointed as executive officer, Bank of Tokyo-Mitsubishi (now MUFG Bank)
May 2005 Appointed as managing executive officer, Bank of Tokyo-Mitsubishi
June 2005 Appointed as managing director, member of the board, Bank of Tokyo-Mitsubishi
Jan. 2006 Appointed as managing director, member of the board, Bank of Tokyo-Mitsubishi UFJ (now MUFG Bank)
May 2009 Appointed as senior managing executive officer, Bank of Tokyo-Mitsubishi UFJ (now MUFG Bank)
June 2011 Appointed as representative director, senior executive vice president, and CFO, Nikon Corporation
June 2016 Appointed as corporate advisor, Nikon; outside Audit & Supervisory Committee member, Hyakujushi Bank
June 2017 Appointed as outside director (Audit & Supervisory Committee member), Hyakujushi Bank (incumbent)
June 2018 Appointed as Audit & Supervisory Board member, NGK (incumbent)



Independent Director
Masayoshi Sakaguchi
Audit & Supervisory Board Member, Outside

Attendance at Board of Directors meetings
Newly appointed
Attendance at Audit & Supervisory Board meetings
Newly appointed

Apr. 1980 Joins National Police Agency
Feb. 1999 Appointed as chief, 1st District, Metropolitan Police Department
Sept. 2001 Appointed as commissioner, Akita Prefectural Police
Jan. 2003 Appointed as chief, Criminal Investigation Dept., Osaka Prefectural Police
Oct. 2011 Appointed as commissioner, Osaka Prefectural Police
Jan. 2013 Appointed as chief, Commissioner-General's Secretariat, National Police Agency
Jan. 2015 Appointed as deputy commissioner, National Police Agency
Aug. 2016 Appointed as commissioner-general, National Police Agency
May 2018 Appointed as special advisor, Nippon Life Insurance Company
June 2019 Appointed as Audit & Supervisory Board member, NGK (incumbent)
Appointed as vice president, Japan Automobile Federation (incumbent)

Remuneration of Directors and Audit & Supervisory Board Members

Policies for Determining Remuneration of Directors

The remuneration of directors (excluding outside directors) and corporate officers consists of the following three components: (1) basic remuneration as fixed annual remuneration according to respective positions; (2) a performance-linked bonus, which is based on the business performance each year; and (3) stock-related remuneration to enhance the motivation, etc. of directors to improve the medium- to long-term corporate value through appropriate corporate management by increasing sensitivity toward the NGK stock price and sharing with shareholders both advantages and risks generated by ups and downs of the stock price. NGK does not pay any performance-linked bonus or stock-related remuneration to outside directors and Audit & Supervisory Board

Members and only pays basic remuneration since they assume roles in supervising and auditing management from an independent standpoint.

With regard to the ratio between this variable remuneration and fixed annual remuneration, the ratio of basic remuneration, performance-linked bonuses, and stock-related remuneration is set from a perspective of putting priority on the stability and enhancement of medium- to long-term performance. The total amount of remuneration, including basic remuneration, is determined in accordance with officers' positions, taking into consideration remuneration levels according to the size of companies and other factors, using data from reliable external research institutions.

Remuneration of Directors and Audit & Supervisory Board Members (fiscal 2018)

Director category	Total remuneration (million yen)	Total remuneration by type (million yen)				Applicable directors (people)
		Fixed remuneration	Performance-linked remuneration	Stock options	Retirement benefits	
Directors (excluding Outside Directors)	570	388	129	53	–	11
Audit & Supervisory Board Members (excluding Outside Audit & Supervisory Board Members)	62	62	–	–	–	2
Outside Directors and Outside Audit & Supervisory Board Members	66	66	–	–	–	6

Directors Receiving Total Remuneration of ¥100 Million or More (fiscal 2018)

Name	Director category	Company category	Total remuneration by type (million yen)				Total remuneration (million yen)
			Fixed remuneration	Performance-linked remuneration	Stock options	Retirement benefits	
Taku Oshima	Director	Submitting companies	68	30	10	–	110

Reasons for Appointment of Outside Directors and Outside Audit & Supervisory Board Members

Outside Directors

Name	Reasons for appointment
Hiroyuki Kamano	Having long engaged in legal practice as an attorney-at-law, Mr. Kumano possesses a wealth of experience and achievements in the legal community, including his service as Vice President of the Tokyo Bar Association. Drawing on this experience, he has been fulfilling his duties as an outside director of the company by sharing opinions regarding strengthening the compliance structure and carrying out management strategy from the viewpoint of investors, as well as offering suggestions in connection with the company's business operation and properly overseeing the management of the company. We have therefore elected him to the position of outside director.
Emiko Hamada	Ms. Hamada has made remarkable achievements, such as leading the invention and world-first commercialization of the CD-R (recordable CD) while working at Taiyo Yuden Co., Ltd. Since then, she has been engaged in research activities mainly based on industry-academia-government collaboration as Professor at the Nagoya Institute of Technology and Visiting Professor at Nagoya University. In her role as outside director she draws upon the insights which she has cultivated over the course of her career to give recommendations about NGK business execution and provide appropriate management oversight; for example, by giving advice on strengthening technological capacity and achieving a clear, unified company-wide direction to product development. We have therefore elected her to the position of outside director.
Kazuo Furukawa	Mr. Furukawa has a wealth of knowledge in information and communications and other technological fields and valuable experience in managing large organizations. At Hitachi, Ltd. he held positions such as head of the information and communications group, CEO, and president. He was also chair of the New Energy and Industrial Technology Development Organization (NEDO). Using this experience, he gives recommendations about business execution and provides appropriate management oversight, thus contributing to increasing the corporate value of NGK. We have therefore elected him to the position of outside director.

Outside Audit & Supervisory Board Members

Name	Reasons for appointment
Junichi Ito	Mr. Ito has been involved with corporate management for many years, including as Senior Management Executive Officer for the Bank of Tokyo-Mitsubishi UFJ, Ltd. (now MUFG Bank, Ltd.) and Representative Director, Senior Executive Vice President and CFO for Nikon Corporation. As an expert in corporate management, Mr. Ito is able to leverage the wealth of experience and the insights he has cultivated over his long career to provide appropriate advice and oversight aimed at strengthening NGK's corporate governance. Based upon this demonstrated competency and capability, he has been selected as an outside audit & supervisory board member.
Masayoshi Sakaguchi	Mr. Sakaguchi has a wealth of experience in the administrative sector and a proven track record in managing large organizations. He was commissioner of the Osaka Prefectural Police, chief of the Commissioner-General's Secretariat (National Police Agency), and commissioner-general of the National Police Agency. Making use of this experience, he audits NGK's overall management from the viewpoint of the legality of business and risk management, thus helping raise NGK's corporate value. We have therefore elected him to the position of outside audit & supervisory board members.

Comments from Outside Directors

NGK Group Code of Conduct: make them your own, put them to work



Hiroyuki Kamano

Outside Director

On the occasion of its 100th anniversary, NGK revamped its NGK Group Philosophy and subsequently revised the NGK Group Code of Conduct. This was a truly significant undertaking. The revisions—regarding helping realize a sustainable society and taking human rights issues head on—go hand-in-hand with the SDGs that are currently gaining steam around the world.

The success of the Code of Conduct now depends on how much NGK Group employees are willing to take ownership of the code and apply it in everything they do. There is no point in simply making slogans. We have to put the code to work by applying it to everything that NGK Group employees do at worldwide group companies.

To this end, everyone must thoroughly understand the Code of Conduct, cement it as their ideal behavioral guidelines, and monitor whether it is being properly enforced. When matters related to compliance occur, checks must be carried out by company departments in charge of legal affairs and internal auditing. When they relate to environmental protection, the Environmental Management Department must take charge. Besides the Board of Directors overseeing governance, each and every department must execute its duties from its own unique standpoint.

Regarding the problem last year of the Non-Conformity Issue occurred in insulators, we have investigated internal audits and whether the case has been fairly addressed from the standpoint of the chairperson of the assessment committee, and we have received a point-by-point report to prevent a reoccurrence. Relevant divisions will thoroughly check that contracts and standards are adhered to, the Quality Management Department and the Group Compliance Department of the Head Office will audit this, and an external third-party institute will assess whether rules are being followed.

Help apply state-of-the-art technologies to business



Kazuo Furukawa

Outside Director

When NGK celebrated its 100th anniversary, I was extremely honored to be appointed an outside director and join in propelling the company through its second century. I hope that I can use my experience in the private and public sectors to contribute to making NGK an even better corporate group.

In my more than 30 years of experience in the manufacturing industry, the NGK Group's ceramic technologies and other manufacturing expertise stand out as something not easily replicated by other companies. NGK is an excellent company that has given the world many significant products.

But science and technology is advancing at an accelerating pace. How well can companies apply state-of-the-art technology to business? Their success in this respect will provide opportunities for growth, and I hope to be of assistance in this area.

I believe that as an outside director, it is my role to view things from a different perspective than company executives in helping raise corporate value. Another role of mine is to monitor from a corporate governance standpoint whether the company is being properly operated in light of social justice and social norms. I will use my experience in running a company to provide practical, easy-to-apply advice to NGK company executives through the Board of Directors and other forums.

Ever since my days of working in a factory, I have made the philosophy of "fundamentals and righteousness" central to all my work. I believe that one of the values of the NGK Group Philosophy—"Quality of Management: Social trust is our foundation"—leads to my philosophy of "fundamentals and righteousness." What's most important is that each one of us takes action. I look forward to speaking with NGK employees on topics such as the company's philosophy and mission.

Open General Meeting of Shareholders

NGK endeavors to hold open General Meeting of Shareholders that its shareholders feel welcome to attend. Every year, we introduce NGK corporate activities at the General Meeting of Shareholders with booths displaying

product exhibits explained by NGK staff.

We also make efforts toward expanding General Meeting of Shareholders-related information, including the following:

(1) Mailing a convocation notice well in advance	Sent 22 days prior to the meeting date.
(2) Disclosing information on the website well in advance	Announced four days before convocation notices are sent out (since fiscal 2018).
(3) Taking part in the Tokyo Stock Exchange (TSE) Electronic Voting Platform*	Online voting system made available.
(4) Posting General Meeting of Shareholders documents on the website	Documents such as convocation notices, the results of vote execution, notices of resolution, and extraordinary reports are disclosed on the website. English-language notices for the General Meeting of Shareholders are sent out.

General Meeting of Shareholders-related information
<https://www.ngk-insulators.com/en/ir/meeting/>

*TSE Electronic Voting Platform: An electronic voting system operated by TSE. It allows people to vote not only through the conventional printed materials but also via the Internet, making the process more convenient for shareholders in Japan and overseas.

Two-Way Communication

In addition to regular presentations held in Japan and overseas, the NGK Group conducts one-on-one meetings and participates in interviews among other ongoing initiatives to expand dialogues with institutional investors.

NGK senior management also visits and conducts one-on-one discussions with institutional investors in Japan and overseas.

Activities in Fiscal 2018

Activities	Details
Japan	Senior management conducted presentations for analysts and institutional investors twice this year. They also conducted one-on-one meetings and participated in interviews.
Overseas	Senior management conducted overseas IR meetings targeting analysts and institutional investors twice this year.
Online IR Library	Included financial reporting information, the timely disclosure of non-financial reporting information, securities reports, annual reports, General Meeting of Shareholder materials, and other information.

Reference
URL

Investor Relations

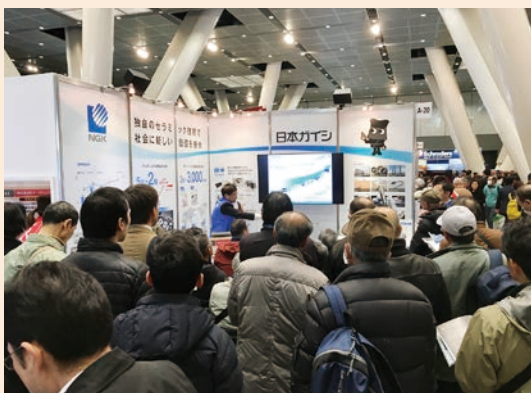
<https://www.ngk-insulators.com/en/ir/>

TOPIC

Participation in Nomura IR Asset Management Fair

To familiarize individual investors with the details of business and performance of NGK, our General Affairs Department and the Finance & Accounting Department took part in the Nomura IR Asset Management Fair 2019 (sponsored by Nomura Investor Relations Co., Ltd.), held at the Tokyo International Forum.

With participation by a total of 62 listed companies and investment firms, the event attracted approximately 12,200 visitors over two days. The NGK booth used panels and small briefings to explain what NGK does and how it is performing.



Measures for Returning Profits to Shareholders

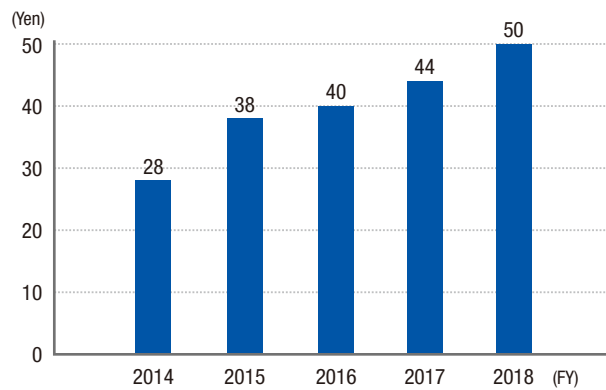
At NGK, returning profits to shareholders is considered one of the highest management priorities.

As a basic policy, we aim for management that focuses on shareholders and ROE. Based on this basic policy, we share profits while comprehensively taking account of our business performance, financial structure, and future business development. Our medium-term benchmark for the consolidated payout ratio is around 30%.

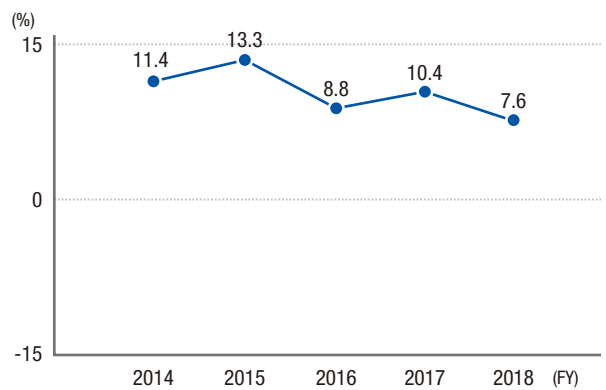
In fiscal 2018, we increased the annual dividend by 6 yen to 50 yen per share. The consolidated payout ratio stood at 45.3%.

We will keep striving to secure profitability above the capital cost and to maintain financial soundness. We opt to proactively return profits to our shareholders from the medium- to long-term perspective.

Dividends per Share



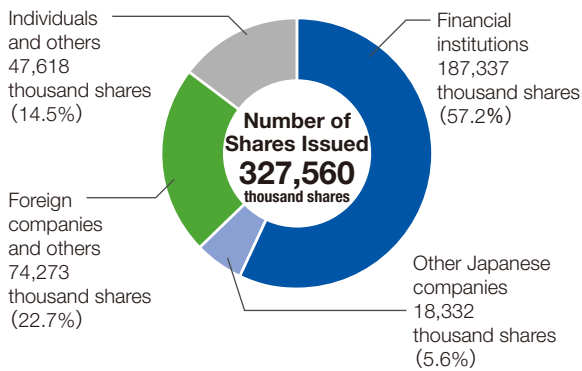
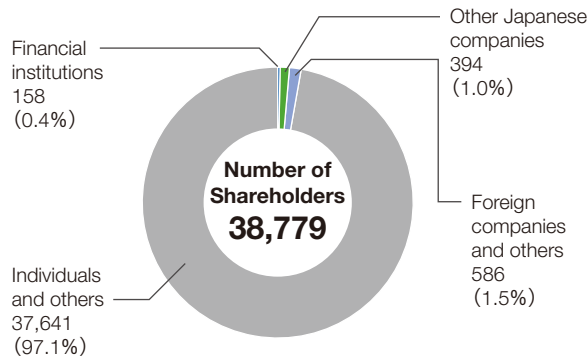
Return on Equity (ROE)



Shareholder Information

Stock Information (as of March 31, 2019)

Total number of shares authorized	735,030,000
Total number of shares issued	327,560,196 (including 5,779,637 treasury shares)
Number of shareholders	38,779



Major Shareholders (as of March 31, 2019)

Name of shareholder	Number of shares held (1,000 shares)	Shareholding ratio (%)
The Master Trust Bank of Japan, Ltd. (Trust Account)	39,323	12.22
Japan Trustee Services Bank, Ltd. (Trust Account)	26,919	8.36
Meiji Yasuda Life Insurance Company	21,695	6.74
The Dai-ichi Life Insurance Company, Limited	21,457	6.66
MUFG Bank, Ltd.	8,748	2.71
National Mutual Insurance Federation of Agricultural Cooperatives	6,299	1.95
JP Morgan Chase Bank 380055	6,175	1.91
Trust & Custody Services Bank, Ltd. (securities investment trust)	4,808	1.49
Japan Trustee Services Bank, Ltd. (Trust Account 5)	4,784	1.48
Aioi Nissay Dowa Insurance Co., Ltd.	4,387	1.36

Note: The above list of major shareholders does not include NGK, which holds a total of 5,779,637 treasury shares. Also, the shareholding ratios above are calculated based on the number of shares derived by deducting the number of treasury shares from the number of shares issued, and rounded down to two decimal places.

Internal Control Systems

The Board of Directors and the executive bodies overseen by the president are responsible for establishing and operating NGK's internal control system. The Auditing Department, a specialized internal audit body, is responsible for assessing the status of business execution at each operating division. Moreover, NGK has established the Internal Controls Committee to manage its reporting system for internal controls pursuant to Japan's Financial Instruments and Exchange Act.

The NGK Group Code of Conduct (revised in January 2019) were formulated as a policy embodying the Group's corporate philosophy. These guidelines specify the Group's fundamental stance with respect to business activities and corporate behavior to ensure it remains a company that is beneficial to society, even in the pursuit of

its economic goals. The CSR Committee, under which the Compliance Subcommittee, Security Subcommittee, and Social Contribution Subcommittee are organized, is responsible for a range of activities that include ensuring compliance with the NGK Group Code of Conduct, laws, regulations and corporate ethics is fully entrenched throughout the Group, and developing responses to incidents and accidents which it believes could significantly impact the Company. The Committee's actions are designed to maintain and improve the level of the Group's internal control system.

Please note that the "Resolution for the Development of Systems to Ensure the Appropriateness of Operations" was amended at a Board of Director meeting held in March 2017.

Thorough Enforcement of Compliance

Viewing compliance as the foundation of CSR, the NGK Group positions enhancing trustworthiness as the most important initiative and strives to create specific systems to inculcate this view among employees, comply with competition laws, prevent corruption, observe contracts, and comply with other laws and regulations.

■ NGK Group Code of Conduct

In January 2019, the NGK Group Code of Conduct was revised. The revisions reflected the changes in society since the last revisions in 2011 and focused on the realization of a sustainable society through business activities, respect for human rights, and thorough compliance. All NGK Group employees will act according to this code as they fulfill their social responsibility and build trust in NGK.

A booklet of the NGK Group Code of Conduct is distributed to all employees and executives. In addition, the CSR Committee Chair and the Group Compliance Department ensure understanding by everyone by holding briefings on the revisions in each business group.

NGK Insulators holds training when newly hired graduates and mid-career hires enter the company to deepen understanding, as well as ongoing training to explain the NGK Group Code of Conduct when employees are promoted.

In addition, educational materials are created and distributed to ensure thorough understanding.

Reference URL **Group Philosophy, Code of Conduct**
<https://www.ngk-insulators.com/en/info/governance/>

■ Realization of a Sustainable Society

1. We will create new value through the provision of products and services that contribute to society, protect the world environment, and strive to realize a sustainable society.

- By providing high quality products and services in which safety is properly considered and which comply with environmental rules, we can respond to the trust of customers and society.
- We will sincerely consider new needs and the desire for improvements from customers and society and undertake product and service development and upgrades.

■ Respect for Human Rights

2. We will strictly comply with international standards of human rights and respect the diversity of all people.

- We will respect human rights and undertake business activities without the use of forced labor or child labor.
- We will respect the individuality and independence of each employee and not engage in discrimination on the basis of race, citizenship, gender, age, religion, belief, existence of handicaps, sexual diversity or any other aspect.
- We will prevent the occurrence of harassment in the workplace and take prompt and appropriate action in the case where it occurs.

■ Provide a Safe and Enjoyable Work Environment

3. We will provide a safe and enjoyable work environment that is comfortable for everyone to work in for all.

- We will strictly comply with laws and regulations of each country and region relating to labor, safety and sanitation.
- We will aim to harmonize work and life, and support a variety of working styles.
- We will build up a relationship of trust through sincere debate and discussion with employees.
- We will give educational opportunities to employees and provide opportunities to stretch their motivation and abilities.

■ Honest Business Activities

4. We will undertake fair and transparent business activities with integrity and strictly comply to international standards, laws and regulations of each country and region.

- We will undertake business activities with common sense and based on strict compliance and ethics.
- We will ensure performance of contracts and agreements with customers and counterparties.
- We will strictly comply with competition laws.
- We will never in any manner undertake bribery
- We will strictly manage personal data and confidential information.
- We will respect the intellectual property rights of other persons.
- We will set up and actively manage our import/export system.
- We will not have any involvement with organized crime and other anti-social forces.
- We will manage business risks and make efforts to prevent the occurrence of problems and promptly respond when they arise.
- In order to deter and correct improper acts, we will appropriately prepare and put into practice a whistleblowing system.

■ Disclosure of Company Information and Accountability

5. We will increase healthy and transparent management by active disclosure of information and discussion with stakeholders.

- We will accurately and promptly disclose information required by society.
- We will take seriously the voices of our stakeholders and fulfill our obligation of accountability.

Permeate Social Responsibility into Our Supply Chain

6. We will promote a structure that fulfills societal responsibilities to our trade counterparts and the supply chain overall.

- We will respect our trade counterparts as equal partners and work to build a trusting relationship for mutual development.
- Through realization of green procurement and CSR, we will contribute to the growth of the region and society.
- We will demand respect for human rights and compliance with laws and regulations from our supply chain.

Preservation of Environment

7. We will work to preserve and resolve the problems of the world environment.

- We will provide products and services that contribute to preservation of the world environment.
- We will directly address the burden of business activities on the environment.
- We will work for preservation of biological diversity and sustainability.
- We will strictly comply with laws and regulations relating to the environment of each country and region.

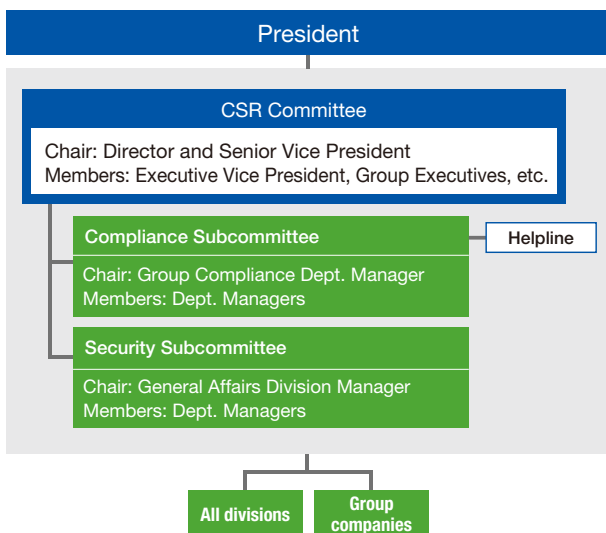
Cooperation with the Region and Society

8. We will contribute to the expansion of the region and society as a good corporate citizen.

- As one member of the region and society we will actively undertake activities that contribute to society.
- We will actively support activities that contribute to society in which employees voluntarily participate.

Compliance Promotion Structure

We established the Compliance Subcommittee under the CSR Committee to ensure strict observance of laws, regulations, and corporate ethics within the Group. The Security Subcommittee has also been established to ensure accident prevention measures are in place, widely known, and strictly practiced.



Establishment of the Global Compliance System

With the aim of building a group-wide foundation for an effective compliance scheme, the Group Compliance Department conducts education on compliance at bases in and outside Japan.

Mission of the Group Compliance Department

- Works to establish and develop compliance as a corporate culture of the entire NGK Group
- Supports Group companies inside and outside Japan in strengthening and operating their compliance systems, and actively provides compliance training
- As for Group companies outside Japan in particular, ensures effective compliance for our globalized operations by obtaining the most up-to-date information regarding applicable laws and social demands in each region

Whistleblowing System

Helpline

We have established a helpline to receive inquiries and reports from employees aimed at curtailing and preventing activities contrary to the spirit of the NGK Group Code of Conduct and to facilitate the quick resolution when issues occur. Each Group company outside Japan has its own helpline. Those seeking advice or reporting issues are promised protection under corporate regulations. There were 75 consultation cases in fiscal 2018.

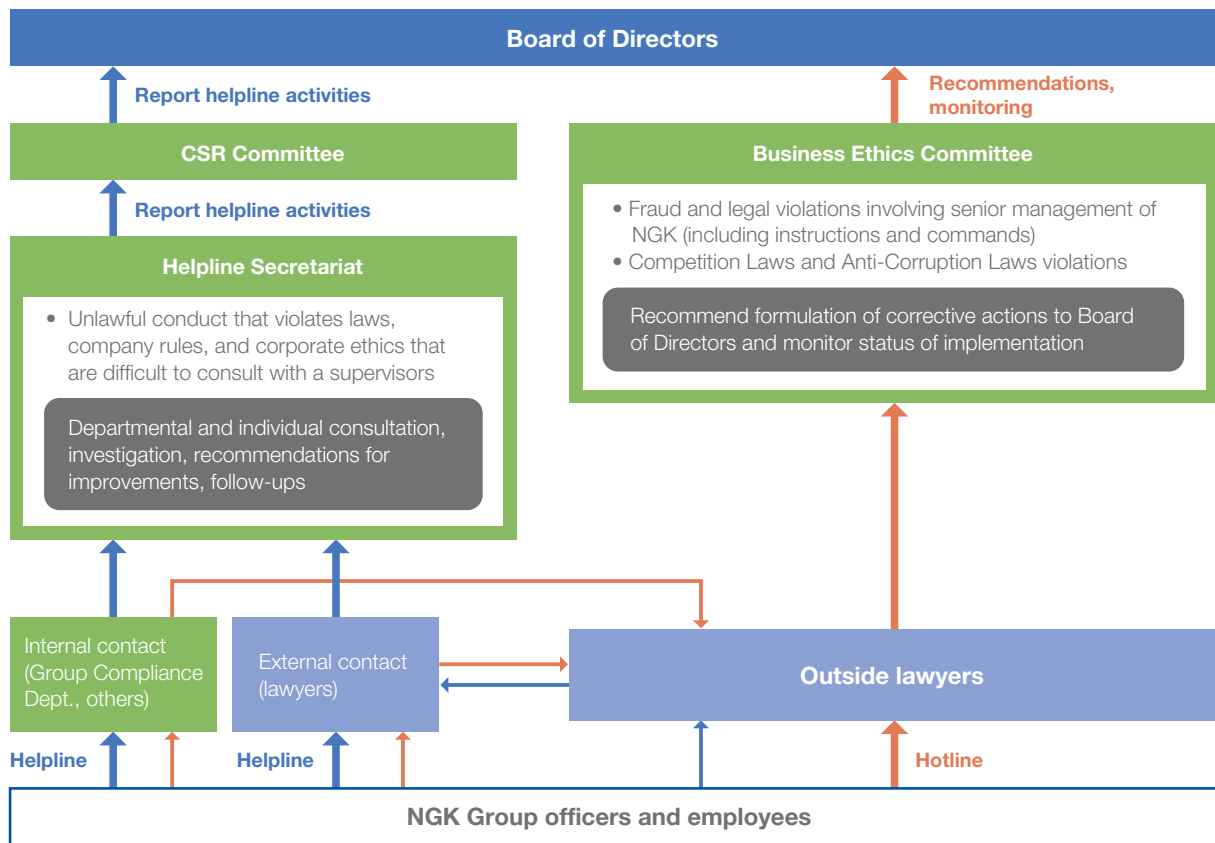
No. of helpline consultation cases (in Japan)

FY2016	FY2017	FY2018
17	43	75

Hotline

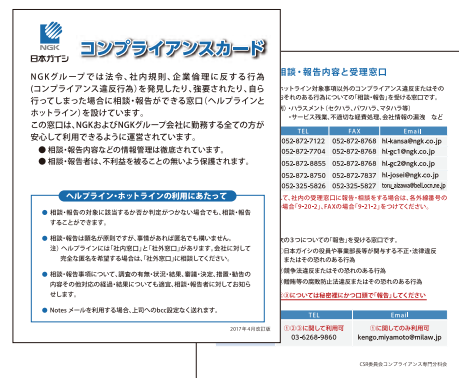
We have established a hotline as a whistleblowing system for responding to fraud, and legal infractions committed by senior management of NGK, and Competition Laws and Anti-Corruption Laws violation. The hotline is operated by outside lawyers, with issues handled by the Business Ethics Committee, composed mainly of outside directors, who report directly to the Board of Directors.

We have been pushing forward with the establishment of the hotline at Group companies outside Japan in light of the circumstances in each country.



Compliance Card

For thorough awareness of the whistleblowing system, we created a carry-size Compliance Card and distributed it to all employees at NGK and all domestic Group companies.



Promoting Compliance Education

Compliance Training for Employees

Compliance training and awareness among corporate officers and employees is driven primarily by the Group Compliance Department and the Legal Department. In addition to career training and training for employees to be posted overseas, we provide Laws and Compliance

Seminars to explain laws and regulations and to introduce case studies.

In fiscal 2018, we added quality compliance and contract observance to our career education courses.

Compliance Education Conducted in FY2018 (Overall)

Title	Target	Content	Number of sessions
Career Education	New hires	Compliance basics, competition laws, anti-bribery regulations	2
	Promoted or career-changed employees	Compliance basics	4
	Mid-career hires	Compliance basics, competition laws, anti-bribery regulations	1
	Newly appointed supervisors	General compliance, competition laws, anti-bribery regulations, quality compliance, contract observance	1
	Newly appointed managers	General compliance, competition laws, anti-bribery regulations, quality compliance, contract observance	1
	Managers promoted second grade	Compliance (including quality compliance)	1
Training for employees scheduled for postings abroad (global training)	Employees scheduled for postings abroad	Competition laws, anti-bribery regulations	2
Compliance education	Group company outside Japan managers and sales staff	Lectures provided by attorneys and paper materials-based in-house training	18
	General employees of NGK Insulators and Japanese Group companies	Compliance, harassment prevention, whistleblowing system	24
Laws and Compliance Seminars	Managers and other targets depending on content	Protect yourself from common crimes Lecturer: Internal lecturer; 502 participants in total Overview of amendments to the Civil Code Lecturer: Internal lecturer; 642 participants in total Quality compliance seminars; two sessions (morning and afternoon) Lecturer: Outside attorney; 789 participants in total* Act on Special Measures Concerning Shifting of the Consumption Tax, Subcontract Act Lecturer: Internal lecturer; 619 participants in total Latest trends in insider trading regulations Lecturer: Internal lecturer; 450 participants in total Response to Stamp Duty Act Lecturer: Internal lecturer; 510 participants in total	6
Other training	All directors and managers, and others connected to training content	Quality compliance seminar Lecturer: Outside attorney	2
	Divisions and Japanese Group companies	Subcontract Act explanatory meeting	3

*Managers take course, which includes watching DVDs

Competition Laws Education Conducted in Fiscal 2018

Title	Target	Content	Number of sessions
Competition Laws Compliance Lectures	All corporate officers, all managers, and salespeople of NGK and its Group companies in Japan	Lectures provided by outside attorneys and DVD-based training	4 (The number of sessions does not include watching DVDs.)
Group company outside Japan Compliance Training	Group company outside Japan managers and sales staff	Lectures provided by attorneys and paper materials-based in-house training	24
On-demand training on competition laws by internal lecturer	Targets depending on content	On-demand training upon divisions' request	2
Training on competition laws for Japanese Group companies	Japanese Group companies	Explanation of key points in observing competition laws in work	3

Anti-Bribery Training Conducted in FY2018

Title	Target	Content	Number of sessions
Training on anti-bribery regulations for Group company outside Japan	Group companies outside Japan managers and sales staff	Lectures provided by attorneys and paper materials-based in-house training	24

Other Dissemination Programs

We post the Compliance Newsletter on the company's intranet once a month. The Newsletter features a four-frame cartoon that explores familiar themes followed by detailed explanations of what we can learn from these examples.

In fiscal 2017, we began making October the annual compliance strengthening month, during which we do things such as put up educational posters and through employees of whistleblowing system.

Themes Covered in the Compliance Newsletter in FY2018

April	Report, note, discuss	October	Corporate ethics month
May	Being a good citizen	November	Personal smartphone use
June	Paid leave	December	Human rights week
July	Dangerous driving	January	Drinking alcohol
August	Fading sense of guilt	February	Power harassment
September	Formalities in giving approvals	March	Information leaks

Compliance Newsletter



Note: Provided by "Compro Custom" compliance training tools service

Corruption Prevention Structure

The NGK Group implements anti-bribery measures in order to ensure fair and transparent transactions. In fiscal 2015, we instituted anti-bribery rules for dealing with foreign public officials in order to ensure compliance with anti-bribery laws as well as ethical standards for business conduct. Further, in fiscal 2017 our Auditing Department began a review of overseas money transfers and entertainment expenses.

Conducting Anti-Bribery Training

In fiscal 2018, our in-house lecturers provided job grade-specific training to NGK employees. In addition, we also arranged for attorney-led seminars and other training at all Group companies outside Japan.

Observing the Competition Law and Other Laws and Regulations Pertaining to Business Transactions

In addition to mandating compliance with Competition Laws in the NGK Group Code of Conduct, we have established the Competition Laws Compliance Rules, set forth to comply with international standards, which are strictly enforced by the NGK Group both in Japan and its overseas locations. We have established these policies and procedures in order to eradicate unfair business practices and maintain fair and equitable business relationships with our business partners.

We also provide education and training aimed at ensuring widespread awareness and thorough compliance with the Competition Laws Compliance Rules and the Competition Laws Compliance Handbook. Furthermore, since fiscal 2015, we have contracted PwC Advisory LLC (hereinafter, "PwC") as our independent compliance professional. PwC is engaged to annually review the

implementation status of the NGK Group's Competition Law compliance program per the Competition Law Compliance Rules as well as assessing the overall oversight and reporting structures in place for NGK Group companies, both in Japan and overseas locations. On top of this, starting in fiscal 2017, PwC has also conducted interviews with the directors overseeing NGK's various business groups in order to: 1) assess the tone of each director's approach toward competition law compliance; and 2) to further enhance their awareness of these efforts. The results of these reviews are being leveraged for a variety of purposes, such as operating and improving the Competition Law compliance program.

Reference
URL

Plea Agreement with U.S. Department of Justice concerning ceramic substrates for catalytic converters

https://www.ngk-insulators.com/en/news/20150904_9235.html

Strengthening Our Compliance System Related to Competition Laws

Year conducted	Regulation Development	Creation of Internal Systems	Training
FY1997	<ul style="list-style-type: none"> Formulated guidebook and briefing document for the Anti-Monopoly Act 	<ul style="list-style-type: none"> Required each business group to submit a Compliance Status Report on the Anti-Monopoly Act 	<ul style="list-style-type: none"> Lectures on the Anti-Monopoly Act by outside instructors (attorneys) (subsequently held annually)
FY2011	<ul style="list-style-type: none"> Formulated Competition Laws Compliance Rules 		
FY2012	<ul style="list-style-type: none"> Created and distributed the Competition Laws Compliance Handbook Created and distributed an Appendix to the Competition Laws Compliance Handbook 	<ul style="list-style-type: none"> Established an independent committee 	<ul style="list-style-type: none"> In-house training led by legal department staff Lectures by local attorneys held at Group companies outside Japan
FY2013			<ul style="list-style-type: none"> Conducted briefing on the Competition Laws Compliance Handbook Invited U.S. attorneys to lecture on competition laws
FY2014	<ul style="list-style-type: none"> Revised Competition Laws Compliance Rules Launched operation of a database for advanced notifications and participation reports pertaining to meetings Launched operation of an e-mail monitoring system Revised Competition Laws Compliance Rules at North American sales subsidiaries 	<ul style="list-style-type: none"> Introduced company-wide centralized supervision and reporting structures led by the Board of Directors (independent of the President) Appointed company-wide competition laws supervisory managers Enhanced the helpline 	<ul style="list-style-type: none"> Conducted study meetings for newly appointed directors on competition laws and the Companies Act by Japanese and U.S. attorneys (subsequently held annually) Conducted study meetings on competition laws at Group companies outside Japan (corresponding to laws and regulations in each country)
FY2015	<ul style="list-style-type: none"> Competition Law Compliance Rules of all NGK Group companies in and outside Japan were revised to ensure that the NGK Group's compliance system meets global standards Revised the Compliance Laws Compliance Handbook 	<ul style="list-style-type: none"> The Competition Laws Compliance Program was resolved by the Board of Directors Established the Global Compliance Office Contracted Pricewaterhouse Coopers to review the implementation status of the NGK Group's Competition Law compliance program and assess the overall oversight and reporting structures in place for NGK Group companies 	<ul style="list-style-type: none"> Conducted study meetings on competition laws for new employees Distributed a DVD on competition laws to domestic group companies Upgraded training on compliance with competition laws provided inside and outside Japan
FY2018	<ul style="list-style-type: none"> Clarified items that should be reported to the hotline when there were violations or fear of violation of competition laws, and revised Competition Laws Compliance Rules. Created a working manual for compliance with competition laws. 	<ul style="list-style-type: none"> Top management of headquarters, business groups, and Group companies provided notifications about compliance with competition laws at beginning of term. 	<ul style="list-style-type: none"> Held seminars on the Companies Act and competition laws for newly appointed directors and executive officers. Held competition laws compliance lectures. All executives and managers attended.

Note: Items marked in blue continue every year

Strict Adherence to Laws and Regulations Relating to Export Management

As part of its full compliance efforts, NGK is engaged in strictly observing and enforcing laws and regulations related to import and export control. Based on the NGK Group Code of Conduct, we stipulate abidance with laws and regulations related to secure export control, and we carry out export control and employee training in accordance with internal rules and the Export/Import Handbook.

Using Databases to Conduct Comprehensive Inspections and Customs Management

In response to the Foreign Exchange and Foreign Trade Act and other export control-related laws and regulations, NGK has screened exports to determine whether export licenses are required and has recorded screening results in a security export control database. However, since October 16, 2017, we have moved to a security export control system (TPP) and are performing management via this new system. Furthermore, export management with respect to the export of certain products is conducted using a specified export declaration system.

We have used an export/import cargo management ledger to fulfill our obligations to track and record imports and exports; however, since our switch to a security export control system (TPP), we have been using the system's shipment ledger to track and record exports. We continue to use an import cargo control ledger for imports. Each department performs voluntary inspections of imports and specified exports at the start of the fiscal year.

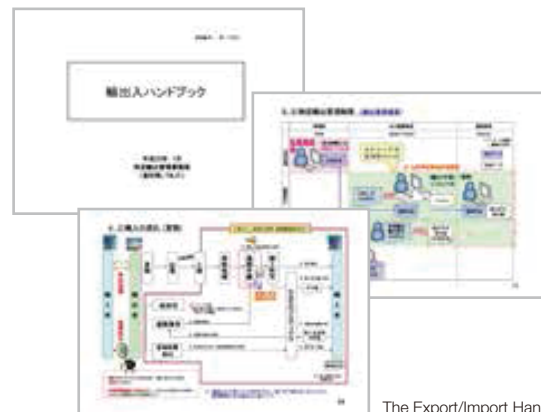
In addition, we use NACCS data (Nippon Automated Cargo and Port Consolidated System) to verify the completeness of export/import cargo management ledgers and shipment ledgers. We have achieved nearly 100% completeness for both imports and exports.

Familiarization with the Export/Import Handbook

NGK also makes efforts toward thorough compliance with the Export/Import Handbook, which was published in fiscal 2012 and summarizes items for the observance of export/import customs clearance regulations.

In addition to publishing this handbook on the company intranet where it can be viewed throughout the entire company, we provide training to spread awareness of the content of the handbook through study meetings related to export/import management conducted in each business division.

Study meetings on specified export and export/import management are held one or more times per year targeting relevant staff in divisions responsible for export and import activities. In fiscal 2018, these meetings were held 21 times, with 292 employees in attendance.



The Export/Import Handbook

Privacy Policy and Structure

The NGK Group has established internal rules for privacy policy management in an effort to ensure strict handling, management, and protection of personal information provided by customers. NGK formulated and made public our Basic Policy on Specific Personal Information in response to the enforcement of the Act on the Use of Numbers to Identify a Specific Individual in Administrative

Procedures. Moreover, our policies are in full compliance with the revised Act on the Protection of Personal Information, which came into effect on May 30, 2017.

Reference
URL

Protection of personal information
<https://www.ngk-insulators.com/en/utpolicy/>

Information Security Policy and Structure

The NGK Group CSR Committee's Security Subcommittee takes responsibility for supervising overall information security, and supports the General Affairs and Information Systems divisions based on the Basic NGK Group Information Security Policy, in an attempt to properly manage and operate information assets.

Every year, personnel of NGK's Information Technology Department visit several Group companies to conduct on-site checks and provide guidance on their implementation of IT security measures. In fiscal 2018, 11 Group companies outside Japan received such inspections.

Reference URL **Basic NGK Group Information Security Policy**
<https://www.ngk-insulators.com/en/info/policies/>

Formulation of Basic NGK Group IT Security Standards

The rapid advance in information communication technologies and devices has made the quest for consistent IT security on a Group-wide level an urgent concern, thus in fiscal 2010 we formulated the NGK Group IT Security Standards with the goal of developing an IT security structure based on commonly shared Group standards and enhancing IT security.

Every year, each Group company drafts action plans for the enactment of countermeasures in an attempt to systematically strengthen security. Through these action plans, NGK confirms initiatives at each Group company and provides guidance as necessary.

Information Security Training

Training sessions listed below are conducted throughout the year to ensure strict adherence to information security among all employees.

Training for newly hired employees and newly promoted supervisors and managers are offered to NGK employees while e-learning is offered to NGK employees and employees of some Group companies in Japan.

Training for newly hired employees	Number of participants: 155 (participation rate: 100%)
Training for newly promoted supervisors	Number of participants: 105 (participation rate: 100%)
Training for newly promoted managers	Number of participants: 50 (participation rate: 98%)
E-learning	Number of participants: 4,321 (participation rate: 100%)

Note: Excluding employees who were away on maternity leave, childcare leave, long-term business trips, etc.

Status of Law and Regulation Violations

There were no violations of laws or regulations in fiscal 2018.

Risk Management

Basic Approach

The NGK Group Code of Conduct states that “We will manage business risks and make efforts to prevent the occurrence of problems and promptly respond when they arise.” Accordingly, the NGK Group makes an all-out effort to control risks.

To minimize risks, which are becoming more global and diversified as our business expands, we periodically review risks, and the CSR Committee periodically follows up on measures to deal with risks.

Reference URL **NGK Group Code of Conduct**
<https://www.ngk-insulators.com/en/sustainability/guideline/>

Risk Analysis and Response

There are six types of risk which are viewed as common to all companies within the NGK Group, including compliance, information, and employment/labor. We make an effort to avoid and prevent these risks through their comprehensive study and analysis.

Business continuity planning (BCP) was formulated to ensure the continuation of critical business functions in the event of large-scale natural disasters including wind and flood damage and earthquakes, massive transportation accidents or other emergency situations, which will be addressed by the Central Disaster Prevention and Control Headquarters and BCP Countermeasures Headquarters.

Company-Wide Shared Risks

Category	Risk
1. Compliance risk	Awareness on compliance and following rules
	Managing material purchasing and expenses
	Entertainment, gift-giving
	Protecting intellectual property
	Human rights, harassment
	Trouble with local communities
	Response to antisocial forces
2. Information risk	Information systems, information security
3. Employment/labor risk	Managing human resources and labor
	Managing labor, safety and hygiene, and health
	Traffic accidents
	Long working hours, health management
	Support for unskilled labor
4. Facilities management, incident/accident/disaster risk	Facilities management
	Incidents and accidents
	Disasters
5. Environmental risk	Management
6. Product safety risk	Defective products

Business Risks

We have identified the following risks which have the potential to impact the operating results, share price, financial position, etc., of the NGK Group.

Production Bases

The NGK Group's main production bases are located in Aichi Prefecture and Ishikawa Prefecture in Japan, and overseas in the Americas, Europe, Asia, and other regions. The Group operates a global production system for its core products, such as ceramic honeycomb substrates for automotive catalytic converters, from the perspective of manufacturing close to demand centers and achieving optimal production. This ensures that risk is dispersed among manufacturing sites. However, irrespective of whether a production base is in Japan or overseas, if facilities at a major production base are seriously damaged by a natural disaster such as an earthquake or fire, production may stop for a considerable period of time, thereby adversely affecting the NGK Group's business performance and financial condition. Overseas operations, in particular, carry such potential risks as i) compliance with the host country's laws, regulations or taxes, ii) adverse changes in the economic environment such as fluctuations in exchange rates, iii) difficulty in securing, educating and training personnel, iv) inadequate infrastructure, and v) societal problems such as terrorism and war.

The unforeseen occurrence of any of these events could adversely impact the NGK Group's business performance and financial condition.

Exchange Rates, Interest Rates, and Material Prices

The NGK Group produces and sells products worldwide. Consequently, the Group hedges the risk of short-term changes in the exchange rates of major currencies, particularly the U.S. dollar, euro and yen, with forward foreign exchange contracts and other financial instruments. However, appreciation of the yen could cause a decline in net sales and earnings, which could adversely impact the NGK Group's business performance.

The NGK Group plans to continue making the necessary capital investments to expand its businesses and improve productivity. The Group's funding needs include these capital expenditures and the redemption of corporate bonds. In the event of interest rate rises, future fund procurement costs may increase, which could adversely impact the NGK Group's business performance and financial condition.

Rises in raw materials prices have led to higher manufacturing costs at NGK Group businesses. To minimize this factor, the Group raises sales prices, cuts costs, improves productivity, and reduces business expenses. The NGK Group endeavors to absorb rises in purchasing prices, but excessive rises in the prices for raw materials may adversely impact the Group's business performance and financial condition.

New Products

The NGK Group works to create new products to secure its growth prospects. The Group makes focused investments in new products that should become pillars of growth in the future. At the same time, NGK is making capital expenditures in stages for products for which demand is expected to expand.

However, in the event that these capital expenditures are not made on schedule, this may adversely impact the NGK Group's medium-term growth prospects.

Changes in the Business Environment

Demand for the products that the NGK Group manufactures and sells is strongly influenced by changes in the economic climate in and outside of Japan. Such changes may adversely impact the Group's business performance and financial condition.

Product Quality

Guided by its Company-wide Quality Policy, the NGK Group conducts quality-related activities in a committed drive to ensure consistent high quality. These efforts notwithstanding, the Group cannot completely eliminate the possibility of quality-related issues from every product that it sells or manufactures. The occurrence of such problems could therefore have a substantial and adverse impact on the Group's business performance.

International Investigation Related to Competitive Conditions

The NGK Group is currently the subject of an international investigation related to competitive conditions and is giving its full cooperation. The investigation is being conducted by authorities concerned with competition, and depending on the outcome, there may be an adverse impact on the Group's business performance and financial position.

Reference
URL

**Plea Agreement with U.S. Department
of Justice concerning ceramic substrates
for catalytic converters**

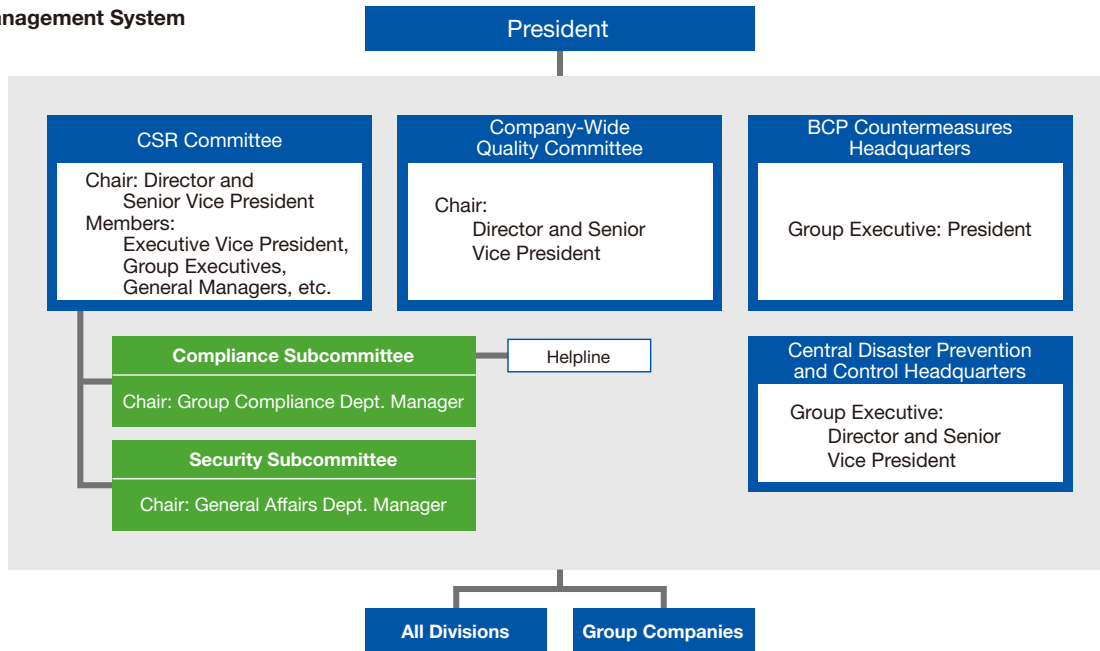
https://www.ngk-insulators.com/en/news/20150904_9235.html

Risk Management System

NGK operates a risk management promotion structure led mainly by the CSR Committee. A person of responsibility and response structure is established for each risk

category in an effort to improve risk response capabilities and risk prevention activities.

Risk Management System



Risk Response

Normal operations		Follow up by CSR Committee and other committees
Emergency situation	Legal/ethical or incident/accident response	CSR Committee is in charge. Initial response by members chosen ahead of time to handle emergencies + relevant corporate officers
	Quality-related accidents	Company-Wide Quality Committee is in charge
	Disaster-related incidents	Central Disaster Prevention and Control Headquarters and BCP Countermeasures Headquarters are in charge

Identifying and Preventing Risks Based on Questionnaire

As part of an effort to enhance risk management practice, NGK and its domestic Group companies have been conducting the CSA (Control Self-Assessment) questionnaire. In fiscal 2017, the CSA questionnaire and the compliance awareness survey were combined into the CRS (Corporate Risk Survey).* The survey checks the understanding of respondents regarding risks with the goal of grasping and preventing various potential risks arising from daily business operations and raising compliance awareness. In fiscal 2018, based on the results of the survey, the relevant divisions and departments created measures to reduce risks in business operations. In addition, the Group Compliance Department and relevant divisions worked together to respond to compliance risks.

In October 2019, we will hold the second CRS in order to reconfirm relevant risks and come up with measures to deal with them.

*Survey conducted in October 2017:

Past CSA questionnaire

Targeted 2,008 people; number of respondents was 1,836 (response rate 91.4%).

Past compliance awareness survey

Targeted 8,133 people; number of respondents was 6,112 (response rate 75.2%)

Risk Management Measures Based on CRS

Group-wide risk response measures formulated by risk response departments and divisions*

Category	Measures Scheduled for FY2019
Group/General	<ul style="list-style-type: none"> • Ongoing monitoring on understanding of responses to incidents specified in the internal Basic Rules of Crisis Management
Compliance	<ul style="list-style-type: none"> • Ongoing compliance training for competition laws, personal information management, intellectual property policies, etc. • Formulate and implement quality compliance program • Implement bribery-prevention training for sales personnel
Information	<ul style="list-style-type: none"> • Implement email training simulating a cyber attack • Revise Information Security Handbook • Complete introduction at Group companies of targeted attack prevention system
Employment/Labor	<ul style="list-style-type: none"> • Ensure employees receive two "refreshment days" a week • Ensure appropriate working hours by using objective data • Establish targets for overtime work reduction
Incidents/Accidents/Disasters	<ul style="list-style-type: none"> • Hold communications drills simulating emergencies • Revise disaster plans in case of an earthquake in the Nankai Trough • Identify all possible critical disaster risks in model facilities, and formulate and launch countermeasures • Hold audits of environmental management status at Group companies in and outside Japan
Product Safety	<ul style="list-style-type: none"> • Have divisions hold self-assessments and conduct necessary measures to improve the quality of work • Make rules for quality compliance at overseas Group companies • Conduct audits of important component suppliers

*Safety & Industrial Health Management Dept., Environmental Management Dept., Quality Management Dept., Corporate Planning Office, Human Resources Dept., Group Compliance Dept., Legal Dept. Intellectual Property Dept., General Affairs Dept., Purchasing Dept., Information Technology Dept., Global Engineering Center

Legal Risk Management at Group Companies Outside Japan

The NGK Group is engaged in strengthening its ascertainment of legal risk management status in overseas business to minimize the globalizing and diversifying risks associated with business expansion.

We ask all Group companies outside Japan to report information pertaining to the status of lawsuits, legal affairs and consultation with lawyers twice a year, and helpline

usage, export controls and access to legal-related information once a year. Major issues found in such reports are reported to the Compliance Subcommittee and CSR Committee to share information.

Consultations from overseas locations are handled by lawyers and legal departments to avoid risks.

List of Risks and Opportunities

Item	Materiality	Risk	Opportunity	Response	Related SDGs
Business Opportunities and Risks	<ul style="list-style-type: none"> Realization of a sustainable society 	<ul style="list-style-type: none"> Decrease in internal combustion engines Delays in the transition to renewable energy Changes in the market environment (China, semiconductor demand) Transfer of technology Labor shortages Exchange rate fluctuations Abnormal weather and disasters 	<p>Strengthened environmental regulations</p> <p>Carbon-free society (expansion in renewable energy use)</p> <p>Expansion of the IoT society</p>	<ul style="list-style-type: none"> Achieve negative emissions with GPFs, EHCs, and NOx sensors Develop a diverse range of battery business, including NAGS[®] batteries, zinc rechargeable batteries, and chip-type batteries Create and expand new products that flexibly accommodate technological innovation Draw up a BCP 	
	E	<ul style="list-style-type: none"> Climate change Water shortages 	<p>Strengthened environmental regulations</p> <p>Transition to a carbon-free society (expansion in renewable energy use)</p>	<ul style="list-style-type: none"> Promote the Five-Year Environmental Action Plan Create products contributing to environmental protection 	
ESG Opportunities and Risks	<ul style="list-style-type: none"> Respect for human rights Provide a safe and enjoyable work environment Permeate social responsibility into our supply chain Cooperation with the region and society 	<ul style="list-style-type: none"> Human rights violations Child labor and forced labor Occupational hazards Stoppage of raw material or component supply 	<p>Securing diverse human resources via work style reforms and diversity promotion</p> <p>Local social contribution activities</p> <p>Sustainable procurement of raw materials and components</p>	<ul style="list-style-type: none"> Human rights due diligence Human rights education Effectively operate the whistleblowing system Reduce long working hours Promote diversity Expand job opportunities for the disabled Provide support for better work-life balance Raise the mandatory retirement age Develop human resources 	
	G	<ul style="list-style-type: none"> Compliance violations Loss of trust from stakeholders due to passive disclosure and insufficient explanation of corporate information 	<p>Maintaining and improving corporate value and securing business continuity through appropriate risk management</p> <p>Increase in trust from stakeholders as a result of active disclosure</p>	<ul style="list-style-type: none"> Thoroughly enforce the CSR Procurement Guidelines Strengthen communication with the supply chain 	

Business Continuity Planning (BCP) Initiatives

The NGK Group is developing company-wide business continuity planning (BCP) through the establishment of the BCP Headquarters, an organization for leading business continuity and quick recovery in the event of a large-scale natural disaster, led by the President. Countermeasure initiatives include the establishment of multiple manufacturing bases and procurement sources, damage mitigation measures related to buildings and equipment, and employee safety assurance.

We conduct emergency drills assuming a natural disaster as a field exercise of the BCP. In the drill, participants are instructed to take real actions faithfully according to the plan, through which we identify in detail issues related to each process and procedure and use the findings to improve the BCP.



Business group BCP drill

Fiscal 2018 Initiatives

- Real-time simulation training was held for business group members and individual committees
- Invited experts to give lectures on practical disaster prevention by companies for key BCP personnel
- Held information exchange meetings with companies in the Chubu region on disaster prevention measures and BCP systems

Future Initiatives

- Hold educational activities (hold disaster prevention seminars, distribute pamphlets, etc.) to promote disaster prevention measures in the home
- Improve BCP effectiveness by holding drills based on more realistic scenarios
- Look into how to provide emergency information in case of an earthquake in the Nankai Trough or planned power outages



Disaster drill

Intellectual Property Management

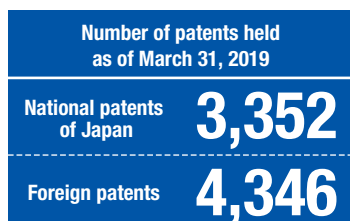
The NGK Group encourages the creation of intellectual property (IP) rights and works to ensure proper protection and use of IP rights. In addition, based on the policy of respect for the rights of others and ourselves, it aims for a strategic patent network to be built within the close cooperation between the Intellectual Property Department and other divisions such as Business, Research and Development, and Technology Divisions.

Specifically, it features a patent mapping function to present the internal and external patent landscape of specific technology areas using charts and graphs, which can be easily shared within the Group.

To prevent patent infringement risks, we regularly conduct patent monitoring of other companies for product family and development theme to update our database.

Responsibilities of the Intellectual Property Department

- Application for/acquisition of IP rights (patent, utility model, design): Establish IP rights for NGK's research and development achievements to safeguard corporate assets on a legal basis
- Patent search: Analyze the current patent landscape of other companies to prevent patent infringement risks
- Administration and operation of patent management systems
- Administrative work relating to acquired patent rights, including maintenance of rights, payment of patent incentives, and cooperation with patent law firms
- Application for/acquisition and maintenance of trademark rights for corporate logos and product trade names and marks
- Copyright
- In house training of Intellectual Property



Promoting Intellectual Property Training

Training for young engineers

E-learning and seminars were provided with the aim of providing basic training for young engineers and of up-skilling for patent applicants.

Also, focusing primarily on young engineers in the Research and Development Department, trainings in patent search methods were conducted. These methods were taught via individual, computer-based practical training.

IP Training Provided in FY2018

	Intended participants	No. of participants
Primer of Patent law, e-learning	Young engineers	79
Seminars on patent law system (Patent I, II, III)	Young engineers	142
Seminars on license agreement and IP strategy	Employees in charge	11
Seminars to acquire skills for using the IP search program	Employees in charge, engineers	80
Small-group workshop	Young engineers in the Business and the Research and Development Division	164 (total for 16 sessions)

Employee Invention Compensation System to Provide Incentives for Employee Inventions

From a legal viewpoint based on the Patent Act and in order to encourage inventions, NGK established an employee invention compensation system comprised of application incentives, registration incentives, and profit incentives to fairly compensate employees. As profit incentives, part of profits have been distributed to the inventors of the patents used in our profit-making products.

In fiscal 2018, the employee invention compensation system was renewed in order to further encourage employees to create superior inventions. The renewed system is divided into four categories: application incentives, registration incentives, implementation incentives, and excellent invention incentives. Implementation Incentives mean fixed-amount incentives for inventions used for products. Since it is not based on whether a product makes a profit or how much profit it makes, and also rewards knowhow created by inventors, it ensures widespread and fair compensation for inventors. For especially excellent inventions, the system honors inventors with a commendation and an incentive higher than that for implementation incentives as reward for their contribution to the company. This renewed system was launched in April 2019.

Provision against Intellectual Property Risks Overseas

To support our business for automotive exhaust purification ceramic products, for which we conduct manufacturing on a global scale, we have built a mechanism for properly managing inventions at overseas plants. NGK promotes the practice of intellectual property management overseas at the same high level as in Japan.

TOPIC

Intellectual Property Research Group Newly Formed

To strengthen our systems for intellectual property investigation and analysis, NGK's search team, previously under the Intellectual Property Planning Group, has been divided and become an independent Group called the Intellectual Property Research Group.

Besides investigating and analyzing the intellectual property of others and ourselves, the Intellectual Property Research Group provides twice-monthly information reports, through the company intranet, on analyses of patent trends and other intellectual property-related information (such as legal revisions and legal disputes).



GRI Guidelines Comparison Table

102 General Disclosures

		Page
GRI 102: General Disclosures 2016		
1 Organizational Profile		
102-1	Name of the organization	<ul style="list-style-type: none"> Corporate Outline (P119)
102-2	Activities, brands, products, and services	<ul style="list-style-type: none"> Value Creation by the NGK Group (P2-3)
102-3	Location of headquarters	<ul style="list-style-type: none"> Corporate Outline (P119)
102-4	Location of operations	<ul style="list-style-type: none"> Corporate Outline (P119) Subsidiaries and Affiliated Companies (P120) Annual Securities Report, Subsidiaries and Affiliated Companies (P7-11) (Japanese)
102-5	Ownership and legal form	<ul style="list-style-type: none"> Corporate Outline (P119)
102-6	Markets served	<ul style="list-style-type: none"> Corporate Outline (P119) Annual Securities Report, Overview of Business (P5) (Japanese)
102-7	Scale of the organization	<ul style="list-style-type: none"> Corporate Outline (P119) Value Creation by the NGK Group (P2-3) Annual Securities Report, Financial Highlights (P2-3) (Japanese)
102-8	Information on employees and other workers	<ul style="list-style-type: none"> Overview of Employees (P53-54)
102-9	Supply chain	–
102-10	Significant changes to the organization and its supply chain	NA
102-11	Precautionary principle or approach	<ul style="list-style-type: none"> CSR Management (P12) Risk Management (P105-109)
102-12	External initiatives	<ul style="list-style-type: none"> Position on SDGs (P15) Human Rights Initiatives (P44)
102-13	Memberships of associations	<ul style="list-style-type: none"> Human Rights Initiatives (P44)
2 Strategy		
102-14	Statement from senior decision-maker	<ul style="list-style-type: none"> Message from the President (P6-11)
102-15	Key impacts, risks, and opportunities	<ul style="list-style-type: none"> Value Creation by the NGK Group (P2-3) Risk Management (P105-109)
3 Ethics and Integrity		
102-16	Values, principles, standards, and norms of behavior	<ul style="list-style-type: none"> NGK Group Philosophy (P1) CSR Management (P12-13) Environmental Philosophy (P17) NGK Group Code of Conduct (P97)
102-17	Mechanisms for advice and concerns about ethics	<ul style="list-style-type: none"> Whistleblowing System (P99)
4 Governance		
102-18	Governance structure	<ul style="list-style-type: none"> Corporate Governance Structure Scheme (P85)
102-19	Delegating authority	<ul style="list-style-type: none"> Environmental Management Frameworks and Environmental Management System (P20) Corporate Governance (P85)
102-20	Executive-level responsibility for economic, environmental, and social topics	<ul style="list-style-type: none"> Environmental Management Frameworks and Environmental Management System (P20)

102-21	Consulting stakeholders on economic, environmental, and social topics	<ul style="list-style-type: none"> • Environmental Management Frameworks and Environmental Management System (P20) • Basic Approach (P84) • Corporate Governance Structure Scheme (P85)
102-22	Composition of the highest governance body and its committees	<ul style="list-style-type: none"> • Board of Directors, Audit & Supervisory Board, Executive Officers (P89-90) • Annual Securities Report, Board of Directors, Audit & Supervisory Board, Executive Officers (P71-76) (Japanese)
102-23	Chair of the highest governance body	<ul style="list-style-type: none"> • Committees on Corporate Governance (P86)
102-24	Nominating and selecting the highest governance body	<ul style="list-style-type: none"> • Election of Board Members, Executive Officers, and Audit & Supervisory Board Members (P88) • Corporate Governance Report, Views on the Balance Between Knowledge, Experience, and Skills of the Board of Directors as a Whole, and Diversity and Size of the Board (P5) • Corporate Governance Report, Matters Concerning Functions of Business Execution, Audit and Supervision, Nomination, Determination of Remuneration, etc. (P17)
102-25	Conflicts of interest	<ul style="list-style-type: none"> • Election of Board Members, Executive Officers, and Audit & Supervisory Board Members (P88) • Board of Directors, Audit & Supervisory Board, Executive Officers (P89-90) • Current Independent Directors and Reasons for Appointment (P91)
102-26	Role of highest governance body in setting purpose, values, and strategy	
102-27	Collective knowledge of highest governance body	
102-28	Evaluating the highest governance body's performance	<ul style="list-style-type: none"> • Evaluation on the Effectiveness of the Board of Directors (P88)
102-29	Identifying and managing economic, environmental, and social impacts	<ul style="list-style-type: none"> • Evaluation on the Effectiveness of the Board of Directors (P88)
102-30	Effectiveness of risk management processes	<ul style="list-style-type: none"> • Risk Management (P105-109)
102-31	Review of economic, environmental, and social topics	
102-32	Highest governance body's role in sustainability reporting	
102-33	Communicating critical concerns	<ul style="list-style-type: none"> • Risk Management (P105-109)
102-34	Nature and total number of critical concerns	
102-35	Remuneration policies	<ul style="list-style-type: none"> • Remuneration of Directors and Audit & Supervisory Board Members (P91)
102-36	Process for determining remuneration	<ul style="list-style-type: none"> • Remuneration of Directors and Audit & Supervisory Board Members (P91)
102-37	Stakeholders' involvement in remuneration	
102-38	Annual total compensation ratio	
102-39	Percentage increase in annual total compensation ratio	
5 Stakeholder Engagement		
102-40	List of stakeholder groups	<ul style="list-style-type: none"> • Targeted Stakeholder and Response Policies (P42)
102-41	Collective bargaining agreements	<ul style="list-style-type: none"> • Annual Securities Report, Overview of Employees (P12) (Japanese)
102-42	Identifying and selecting stakeholders	<ul style="list-style-type: none"> • Targeted Stakeholder and Response Policies (P42)
102-43	Approach to stakeholder engagement	<ul style="list-style-type: none"> • Communication with Stakeholders (P41) • Implementation Status of Stakeholder Engagement (P43)
102-44	Key topics and concerns raised	<ul style="list-style-type: none"> • System for Making Use of Customer Feedback in Management (P52) • Communication Activities with Procurement Partners (P75)
6 Reporting Practice		
102-45	Entities included in the consolidated financial statements	<ul style="list-style-type: none"> • Corporate Outline (P119)

102-46	Defining report content and topic boundaries	
102-47	List of material topics	<ul style="list-style-type: none"> • CSR Activities Concepts and Systems (P12-13)
102-48	Restatements of information	NA
102-49	Changes in reporting	NA
102-50	Reporting periods	<ul style="list-style-type: none"> • Target Period (P1)
102-51	Date of most recent report	NGK Report Archive https://www.ngk-insulators.com/en/sustainability/backnumber.html
102-52	Reporting cycle	NGK Report Archive https://www.ngk-insulators.com/en/sustainability/backnumber.html
102-53	Contact point for questions regarding the report	<ul style="list-style-type: none"> • For inquiries about this report (Back cover) • Inquiries about sustainability https://www.ngk-insulators.com/en/contact/sustainability.html
102-54	Claims of reporting in accordance with the GRI Standards	
102-55	GRI content index	<ul style="list-style-type: none"> • CSR Data / Content Index (P112-118)
102-56	External assurance	<ul style="list-style-type: none"> • Third-Party Assurance (P121)

103 Management Approach

GRI 103: Management Approach 2016		
103-1	Explanation of the material topic and its boundary	<ul style="list-style-type: none"> • CSR Management (P12-13)
103-2	The management approach and its components	<ul style="list-style-type: none"> • CSR Management (P12-13) • CSR Promotion Framework (P14) • NGK's Core Policy on the Environment (P17) • Five-Year Environmental Action Plan (P18) • Environmental Management Frameworks and Environmental Management System (P20) • Activities Aimed at Achieving the "Aichi Target" (P32) • Targeted Stakeholder and Response Policies (P42) • Essential Policy, Quality Objective 2019 (P45) • System for Making Use of Customer Feedback in Management (P52) • Structure of Promote Safety and Health Management (P55) • System to Promote Diversity (P59) • Supply Chain Management System (P72) • Social Contribution Activity Promotion System (P76) • Corporate Governance Structure Scheme (P85) • NGK Group Code of Conduct (P97) • Compliance Promotion Structure (P98) • Whistleblowing System (P99) • Corruption Prevention Structure (P101) • Risk Management System (P107)
103-3	Evaluation of the management approach	<ul style="list-style-type: none"> • Results of Initiatives within the Five-Year Environmental Action Plan (P19)

200 Economic Performance

GRI 201: Economic Performance 2016		
201-1	Direct economic value generated and distributed	<ul style="list-style-type: none"> • Annual Securities Report, Financial Highlights (P2) (Japanese)
201-2	Financial implications and other risks and opportunities due to climate change	<ul style="list-style-type: none"> • Value Creation by the NGK Group (P2-3) • Water Resources Risk Management/Response (P31) • List of Risks and Opportunities (P109)
201-3	Defined benefit plan obligations and other retirement plans	
201-4	Financial assistance received from government	

GRI 202: Market Presence 2016		
202-1	Ratios of standard entry level wage by gender compared to local minimum wage	
202-2	Proportion of senior management hired from the local community	
GRI 203: Indirect Economic Impacts 2016		
203-1	Infrastructure investments and services supported	<ul style="list-style-type: none"> Value Creation by the NGK Group (P2-3) NGK Report 2019, At a Glance (P13-14)
203-2	Significant indirect economic impacts	
GRI 204: Procurement Practices 2016		
204-1	Proportion of spending on local suppliers	
GRI 205: Anti-Corruption 2016		
205-1	Operations assessed for risks related to corruption	
205-2	Communication and training about anti-corruption policies and procedures	<ul style="list-style-type: none"> Thorough Enforcement of Compliance (P97-104)
205-3	Confirmed incidents of corruption and actions taken	NA
GRI 206: Anti-Competitive Behavior 2016		
206-1	Legal actions for anti-competitive behavior, anti-trust, and monopoly practices	<ul style="list-style-type: none"> Status of Law and Regulation Violations (P104)

300 Environmental Standards

GRI 301: Materials 2016		
301-1	Materials used by weight or volume	<ul style="list-style-type: none"> Overall Perspective of Environmental Impact (P24)
301-2	Recycled input materials used	
301-3	Reclaimed products and their packaging materials	<ul style="list-style-type: none"> Five-Year Environmental Action Plan Progress Report>Recycling rate (P19)
GRI 302: Energy 2016		
302-1	Energy consumption within the organization	<ul style="list-style-type: none"> Overall Perspective of Environmental Impact (P24) INPUT (P25)
302-2	Energy consumption outside of the organization	<ul style="list-style-type: none"> Overall Perspective of Environmental Impact (P24) INPUT (P25)
302-3	Energy intensity	<ul style="list-style-type: none"> Five-Year Environmental Action Plan Progress Report (P19)
302-4	Reduction of energy consumption	<ul style="list-style-type: none"> Five-Year Environmental Action Plan Progress Report (P19)
302-5	Reductions in energy requirements of products and services	
GRI 303: Water and Effluents 2018		
303-1	Mutual use of water as a shared resource	
303-2	Management of wastewater-related impacts	
303-3	Water intake	<ul style="list-style-type: none"> Overall Perspective of Environmental Impact (P24)
303-4	Wastewater	<ul style="list-style-type: none"> Overall Perspective of Environmental Impact (P24)
303-5	Water consumption	<ul style="list-style-type: none"> Overall Perspective of Environmental Impact (P24) Water Resource Risk Management/Response (P31)

GRI 304: Biodiversity 2016		
304-1	Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas	<ul style="list-style-type: none"> • Biodiversity Survey of Company-Owned Site (P33)
304-2	Significant impacts of activities, products, and services on biodiversity	
304-3	Habitats protected or restored	<ul style="list-style-type: none"> • Contributing to preservation of skunk cabbage colonies (P79)
304-4	IUCN Red List species and national conservation list species with habitats in areas affected by operations	
GRI 305: Emissions 2016		
305-1	Direct (Scope 1) GHG emissions	<ul style="list-style-type: none"> • Overall Perspective of Environmental Impact (P24) • INPUT (P25)
305-2	Energy indirect (Scope 2) GHG emissions	<ul style="list-style-type: none"> • Overall Perspective of Environmental Impact (P24) • OUTPUT (P25) • Introduction of Green Power (P29)
305-3	Other indirect (Scope 3) GHG emissions	<ul style="list-style-type: none"> • Overall Perspective of Environmental Impact (P24) • Reporting Scope 3 CO₂ Emissions (P29)
305-4	GHG emissions intensity	<ul style="list-style-type: none"> • Measures to Reduce CO₂ Emissions and Effects (P26)
305-5	Reduction of GHG emissions	<ul style="list-style-type: none"> • Five-Year Environmental Action Plan Progress Report (P19) • Environmental Efficiency (P39)
305-6	Emissions of ozone-depleting substances (ODS)	
305-7	Nitrogen oxides (NO _x), sulfur oxides (SO _x), and other significant air emissions	
GRI 306: Effluents and Waste 2016		
306-1	Water discharge by quality and destination	<ul style="list-style-type: none"> • Overall Perspective of Environmental Impact (P24)
306-2	Waste by type and disposal method	<ul style="list-style-type: none"> • Overall Perspective of Environmental Impact (P24)
306-3	Significant spills	NA
306-4	Transport of hazardous waste	
306-5	Water bodies affected by water discharges and/or runoff	
GRI 307: Environmental Compliance 2016		
307-1	Non-compliance with environmental laws and regulations	NA
GRI 308: Supplier Environmental Assessment 2016		
308-1	New suppliers that were screened using environmental criteria	
308-2	Negative environmental impacts in the supply chain and actions taken	

400 Social Standards

GRI 401: Employment 2016		
401-1	New employee hires and employee turnover	<ul style="list-style-type: none"> • Employees>Turnover ratio (P54) • Diversity (P59)
401-2	Benefits provided to full-time employees that are not provided to temporary or part-time employees	<ul style="list-style-type: none"> • Enhancement of Work-Life Balance Systems (P64) • Systems Operated Independently by NGK (P65)
401-3	Parental leave	<ul style="list-style-type: none"> • Systems That Exceed Legal Requirements (P65)
GRI 402: Labor/Management Relations 2016		
402-1	Minimum notice periods regarding operational changes	

GRI 403: Occupational Health and Safety 2016		
403-1	Occupational safety and health management system	• Health and Safety (P55-58)
403-2	Identification of danger (hazard), risk assessment, accident survey	• Health and Safety (P55-58)
403-3	Occupational health service	• Health and Safety (P55-58)
403-4	Laborers' participation in, discussion about, and mutual communication regarding occupational safety and health	• Health and Safety (P55-58)
403-5	Laborers' training related to occupational safety and health	• Health and Safety (P55-58)
403-6	Improvement of laborers' health	• Health and Safety (P55-58)
403-7	Prevention and alleviation of negative effects on occupational safety and health that are directly linked to business	
403-8	Laborers covered by an occupational safety and health management system	• Health and Safety (P55-58)
403-9	Work-related injuries	• Health and Safety (P55-58)
403-10	Illnesses and poor health related to work	• Health and Safety (P55-58)
GRI 404: Training and Education 2016		
404-1	Average hours of training per year per employee	• Training Participant Summary (P67)
404-2	Programs for upgrading employee skills and transition assistance programs	• Promoting Systematic Education through Nearly 120 Programs (P67-70)
404-3	Percentage of employees receiving regular performance and career development reviews	• Promoting Systematic Education through Nearly 120 Programs (P67-70)
GRI 405: Diversity and Equal Opportunity 2016		
405-1	Diversity of governance bodies and employees	<ul style="list-style-type: none"> • Diversity (P59-62) • Board of Directors, Audit & Supervisory Board, Executive Officers (P89-90) • Corporate Governance Report, Views on the Balance Between Knowledge, Experience, and Skills of the Board of Directors as a Whole, and Diversity and Size of the Board (P5)
405-2	Ratio of basic salary and remuneration of women to men	
GRI 406: Non-Discrimination 2016		
406-1	Incidents of discrimination and corrective actions taken	
GRI 407: Freedom of Association and Collective Bargaining 2016		
407-1	Operations and suppliers in which the right to freedom of association and collective bargaining may be at risk	
GRI 408: Child Labor 2016		
408-1	Operations and suppliers at significant risk for incidents of child labor	<ul style="list-style-type: none"> • Human Rights Initiatives (P44) • Promotion of CSR Procurement (P74)
GRI 409: Forced or Compulsory Labor 2016		
409-1	Operations and suppliers at significant risk for incidents of forced or compulsory labor	<ul style="list-style-type: none"> • Human Rights Initiatives (P44) • Promotion of CSR Procurement (P74)
GRI 410: Security Practices 2016		
410-1	Security personnel trained in human rights policies or procedures	
GRI 411: Rights of Indigenous Peoples 2016		
411-1	Incidents of violations involving rights of indigenous peoples	NA

GRI 412: Human Rights Assessment 2016		
412-1	Operations that have been subject to human rights reviews or impact assessments	
412-2	Employee training on human rights policies or procedures	
412-3	Significant investment agreements and contracts that include human rights clauses or that underwent human rights screening	
GRI 413: Local Communities 2016		
413-1	Operations with local community engagement, impact assessments, and development programs	• Local Communities (P78-80)
413-2	Operations with significant actual and potential negative impacts on local communities	
GRI 414: Supplier Social Assessment 2016		
414-1	New suppliers that were screened using social criteria	
414-2	Negative social impacts in the supply chain and actions taken	
GRI 415: Public Policy 2016		
415-1	Political contributions	
GRI 416: Customer Health and Safety 2016		
416-1	Assessment of the health and safety impacts of product and service categories	• Quality Activity System (P46)
416-2	Incidents of non-compliance concerning the health and safety impacts of products and services	NA
GRI 417: Marketing and Labeling 2016		
417-1	Requirements for product and service information and labeling	
417-2	Incidents of non-compliance concerning product and service information and labeling	NA
417-3	Incidents of non-compliance concerning marketing communications	NA
GRI 418: Customer Privacy 2016		
418-1	Substantiated complaints regarding concerning breaches of customer privacy and losses of customer data	• Status of Law and Regulation Violations (P104)
GRI 419: Socioeconomic Compliance 2016		
419-1	Non-compliance with laws and regulations in the social and economic area	NA

Corporate Outline and Organization

Corporate Outline

Company name	NGK Insulators, Ltd.	Consolidated subsidiaries	57 consolidated subsidiaries (21 in Japan, 14 in North/Central America, 6 in Europe, 16 in Asia and elsewhere)
Address	2-56 Suda-cho, Mizuho, Nagoya 467-8530, Japan Telephone + (81) 52-872-7181	Equity-method affiliates	2
Established	May 5, 1919	Employees	NGK 4,119 (as of March 31, 2019) Consolidated 20,115 (as of March 31, 2019)
Paid-in capital	69.8 billion yen (as of March 31, 2019)		
Net sales	463.5 billion yen (consolidated, for FY2018)		

Organization

Head Office

- Auditing Department
- Quality Management Department
- Environmental Management Department
- Safety & Industrial Health Management Department
- Corporate Planning Office
- New Business Planning Department
- Secretarial Office
- Corporate Communications Department
- Human Resources Department
- Group Compliance Department
- Finance & Accounting Department
- Legal Department
- Intellectual Property Department
- General Affairs Department
- Purchasing Department

Corporate R&D

- Business Planning Department
- Wafer Project
- NCM Project
- Functional Materials Development Project
- SOFC Project
- ZNB Project
- ACB Project
- Materials Research Laboratory
- Future Technology Management Center

Corporate Manufacturing Engineering

- Administration Department
- Manufacturing Engineering Department
- Information Technology Department
- Construction & Maintenance Department
- Global Engineering Department

Power Business Group

- Business Planning Department
- Quality Assurance Department
- Insulator Division
- NAS Battery Division

Ceramic Products Business Group

- Business Planning Department
- Quality Assurance Division
- Global Sales & Marketing Division
- Engineering Division
- Manufacturing Division
- Sensor Division

Electronics Business Group

- Business Planning Department
- Quality Assurance Department
- New Metals Division
- Electronic Components Division
- Advanced Device Components Division
- General Management Department
- Electronic Sales & Marketing Department

Process Technology Business Group

- Business Planning Department
- Quality Assurance Department
- High Performance Ceramics Division
- Industrial Process Division

Subsidiaries and Affiliated Companies

Sites, Main Office, Branch, Sales Offices

Head office / Tokyo Main Office / Osaka Branch / Chita Site / Komaki Site / Ishikawa Plant / Sapporo Sales Office / Sendai Sales Office / Hokuriku Sales Office / Hiroshima Sales Office / Takamatsu Sales Office / Fukuoka Sales Office

Group Companies in Japan

Energy Support Corporation / Kansai Energys Corporation / Hokuriku Energys Corporation / Energys Sangyo Corporation / Kyushu Energys Co., Ltd. / Tokai Energys Corporation / Akechi Insulators, Ltd. / NGK Okhotsk, Ltd. / Soshin Electric Co., Ltd. / Soshin Device Co., Ltd. / Soshin Powertech Co., Ltd. / Risshin Electronics Co., Ltd. / NGK Electronics Devices, Inc. / NGK Ceramic Device Co., Ltd. / NGK Metex Corporation / NGK Fine Molds, Ltd. / Ikebukuro Horo Kogyo Co., Ltd. / NGK Chem-Tech, Ltd. / NGK Filtech, Ltd. / NGK Adrec Co., Ltd. / NGK Kilntech Corporation / NGK Sports Planning Co., Ltd. / NGK Life Co., Ltd. / NGK Yu-Service Co., Ltd. / NGK Logistics, Ltd.

Group Companies Overseas

America

NGK-Locke Inc. / NGK-Locke Polymer Insulators, Inc. / NGK Ceramics USA, Inc. / NGK Automotive Ceramics USA, Inc. / NGK Metals Corporation / FM Industries, Inc. / NGK Electronics USA, Inc. / NGK Insulators of Canada, Ltd. / NGK Ceramics Mexico, S. de R.L. de C.V.

Europe, Africa

NGK Berylco U.K. Ltd. / NGK Ceramics Europe S.A. / NGK Europe GmbH / NGK Deutsche Berylco GmbH / NGK Berylco France / NGK Ceramics Polska Sp. z o.o. / NGK Ceramics South Africa (Pty) Ltd.

Asia, Oceania

NGK Insulators (China) Investment Co., Ltd. / NGK Ceramics Suzhou Co., Ltd. / NGK Technocera Suzhou Co., Ltd. / NGK Automotive Ceramics Korea Co., Ltd. / P.T. NGK Ceramics Indonesia / Siam NGK Technocera Co., Ltd. / NGK Ceramics (Thailand) Co., Ltd. / NGK Technologies India Pvt. Ltd. / NGK Stanger Pty. Ltd.

Other Group Companies

NGK Italy S.r.L. / Energys Electric Shanghai Corporation / NGK Electronics Devices (M) Sdn. Bhd. / Soshin Electronics of America Inc. / Soshin Electronics (HK) Limited / Taiwan Soshin Electric Co., Ltd. / NGK Material USA, Inc. / NGK Energys Myanmar Co., Ltd. / NGK Globetronics Technology Sdn. Bhd. / Soshin Electronics Europe GmbH / Soshin Electronics (SZ) Limited / Soshin Electronics (M) Sdn. Bhd.

Details of NGK are available on the company website

This is the Sustainability Data Book, a report on NGK's sustainability-related efforts. Our website also has sustainability information, in addition to detailed corporate information and investor relations.



About NGK

[English]

<https://www.ngk-insulators.com/en/info/>

[Japanese]

<https://www.ngk.co.jp/info/>



Investor Relations

[English]

<https://www.ngk-insulators.com/en/ir/>

[Japanese]

<https://www.ngk.co.jp/ir/>



Sustainability

[English]

<https://www.ngk-insulators.com/en/sustainability/>

[Japanese]

<https://www.ngk.co.jp/sustainability/>

Independent Practitioner's Assurance

Deloitte.

デロイト トーマツ

(TRANSLATION)

Independent Practitioner's Assurance Report

July 23, 2019

Mr. Taku Oshima,
President,
NGK Insulators, Ltd.

Masahiko Sugiyama
Representative Director
Deloitte Tohmatsu Sustainability Co., Ltd.
3-2-3, Marunouchi, Chiyoda-ku, Tokyo

We have undertaken a limited assurance engagement of the energy-origin CO₂ emissions on a non-consolidated basis on page 24 (the "CO₂ Information") for the year ended March 31, 2019 included in the "NGK Sustainability Data Book 2019 (PDF)" (the "Report") of NGK Insulators, Ltd. (the "Company").

The Company's Responsibility

The Company is responsible for the preparation of the CO₂ Information in accordance with the calculation and reporting standard adopted by the Company (the Report page 24). CO₂ quantification is subject to inherent uncertainty for reasons such as incomplete scientific knowledge used to determine emissions factors and numerical data.

Our Independence and Quality Control

We have complied with the independence and other ethical requirements of the Code of Ethics for Professional Accountants issued by the International Ethics Standards Board for Accountants, which is founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behavior. We apply International Standard on Quality Control 1, *Quality Control for Firms that Perform Audits and Reviews of Financial Statements, and Other Assurance and Related Services Engagements*, and accordingly maintain a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

Our Responsibility

Our responsibility is to express a limited assurance conclusion on the CO₂ Information based on the procedures we have performed and the evidence we have obtained. We conducted our limited assurance engagement in accordance with the International Standard on Assurance Engagements ("ISAE") 3000, *Assurance Engagements Other than Audits or Reviews of Historical Financial Information*, issued by the International Auditing and Assurance Standards Board ("IAASB"), ISAE 3410, *Assurance Engagements on Greenhouse Gas Statements*, issued by the IAASB and the *Practical Guideline for the Assurance of Sustainability Information*, issued by the Japanese Association of Assurance Organizations for Sustainability Information.

The procedures we performed were based on our professional judgment and included inquiries, observation of processes performed, inspection of documents, analytical procedures, evaluating the appropriateness of quantification methods and reporting policies, and agreeing or reconciling with underlying records. These procedures also included the followings:

- Evaluating whether the Company's methods for estimates are appropriate and had been consistently applied. However, our procedures did not include testing the data on which the estimates are based or reperforming the estimates.
- Undertaking site visits to assess the completeness of the data, data collection methods, source data and relevant assumptions applicable to the sites.

The procedures performed in a limited assurance engagement vary in nature and timing from, and are less in extent than for, a reasonable assurance engagement. Consequently, the level of assurance obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had we performed a reasonable assurance engagement.

Limited Assurance Conclusion

Based on the procedures we have performed and the evidence we have obtained, nothing has come to our attention that causes us to believe that the CO₂ Information is not prepared, in all material respects, in accordance with the calculation and reporting standard adopted by the Company.

The above represents a translation, for convenience only, of the original Independent Practitioner's Assurance report issued in the Japanese language.

Member of
Deloitte Touche Tohmatsu Limited



External Evaluation

In September 2019, NGK was selected for the 4th consecutive year for the Dow Jones Sustainability Asia Pacific Index in the Dow Jones Sustainability Indices, a major index for socially responsible investment.



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Published in September 2019