

TOP COMMITMENT

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Development for Sustainable Growth into the Future

Develop our own strengths for further growth

Since its founding, the NGK Group has been consistently expanding its business engaging in manufacturing and supplying products which make good use of ceramics technology. We have built up high proprietary technologies, expertise and quality in ceramics development, which represent our unrivaled strengths. Application areas of our ceramics technologies range broadly from ceramic catalytic substrates for automotive exhaust gas purification and NOx sensors—key tools for meeting emission regulations that are being progressively tightened around the world—to ceramic components for semiconductor manufacturing equipment, for which demand is soaring driven by the accelerating advancement of the Artificial Intelligence (AI) and the Internet of Things (IoT) technologies.

In fiscal 2016, we recorded a year-on-year decline in net sales and profits due to a generally stronger yen and a considerable increase in facility and development investments. In our plan, those investments have been made to enhance our capabilities to develop and manufacture new products, which will increase net sales and profits in the long run.

In order to develop our strengths and to achieve further growth, we are promoting a number of group-wide initiatives in parallel, including the "New/reformed manufacturing structures" initiative designed to enhance our competitiveness over the medium to long term, and the "2017 Challenge 30*" project aimed at raising the share of new products to 30% or more of total sales.

Develop our personnel, a foundation for growth

I have consistently focused on personnel development and work style reform over the past three years since assuming the presidency, which are an essential foundation for

achieving sustainable growth in business. We have been striving to create a workplace where all employees, regardless of age, gender or career, can enjoy satisfying work, demonstrating their capabilities and cultivating forward-looking views. Our efforts have been recently stepped up to particularly address the theme of women's empowerment, that is, by developing appropriate systems and measures to offer an environment where many women can play an important role and build lifelong careers. We will develop a work environment where each employee can fulfill their potential and aim to be a company that continuously achieves sustainable growth.

Develop a sustainable future

To pursue global business, the NGK Group has signed on to the United Nations Global Compact, an initiative to encourage businesses to adopt sustainable and socially responsible policies. Accordingly, we will work to undertake socially responsible actions to contribute to solving various global challenges in support of the UN Sustainable Development Goals (SDGs) and other international initiatives. It is also vital to comply with competition laws and other applicable laws and regulations and respect human rights. We in addition believe that it is important to follow internationally appropriate corporate behavior, including a fair attitude toward diverse values. Our business activities and the resolution of such social issues are integrated because the products we develop and supply are largely involving social infrastructure projects and environmental issues.

The NGK Group will be challenging by gathering our group strengths to manufacture and supply products that contribute to a better societal environment and create new value into the future.



* The project will be renamed "Keep up 30," from fiscal 2018.

Group-wide Endeavors Aimed at Sustainable Growth

01 Boosting Competitiveness of Existing Businesses

02 Creating New Products and Businesses

03 Strengthening Global Business Management

04 Promoting Personnel Development and Work Style Reform

01 Boosting Competitiveness of Existing Businesses

New/Reformed Manufacturing Structures

The NGK Group works to increase product value based on advanced technologies and improve productivity through innovating manufacturing processes.

Looking at our business environment from a medium- to long-term perspective, we are implementing our New/Reformed Manufacturing Structures initiative, which was started in 2014, to build strong capabilities to continue competing successfully in global markets toward 2020 and beyond. The initiative focuses on improving operational efficiency for existing facilities and promoting prioritized investments for greater spending effect.

In the fields of energy, ecology and electronics, NGK's three major business domains, new social and technological needs are emerging, and this is expected to create new market opportunities. Seeking to capture these future opportunities, we plan to invest a total of 300 billion yen over the coming three years. Our plan includes construction of cutting-edge lines for auto-related products outside of Japan in order to respond to the growing demand on a global scale. Thus, we aim to develop solid production capabilities to continue business growth.

Advanced Technologies

- Increase product value
- Improve productivity through innovating manufacturing processes

New/Reformed Manufacturing Structures

- Improve operational efficiency for existing facilities
- Increase effectiveness of new investments

Enhancing Global Production Structures

- Build cutting-edge production lines outside of Japan
- Establish an efficient global production structure

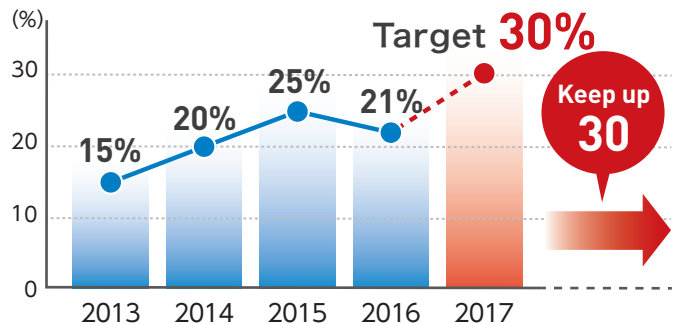


02 Creating New Products and Businesses

2017 Challenge 30

The NGK Group works to create new products and business. We set a target of raising the share of new products to 30% or more of total sales by fiscal 2017 (2017 Challenge 30), and have progressed steadily to achieve the target in fiscal 2017. From fiscal 2018, we will continue with these efforts to achieve a revised target of maintaining the share of new products at 30% or above (Keep up 30).

Sales percentage for new products
Target expected to be achieved in FY 2017



Accelerating Business Development for New Products

To accelerate business development for new products, we organize cross-divisional activities. Our two ongoing projects relate to ceramic batteries and ceramic optical components, and were launched in fiscal 2016 and 2017, respectively. In both, Corporate Manufacturing Engineering,

Corporate R&D, the relevant business division and the head office are working together to engage in the development of commercial products, mass production facilities and potential customers, seeking to expedite the commercialization of target new products.

The Optical Component Project

The company-wide, cross-divisional Optical Component Project was launched in April 2017, with a plan to establish a relevant business within the Electronics Business Group.

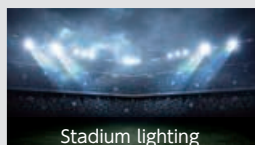
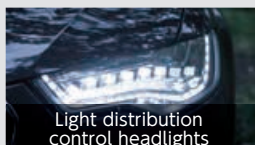
Gallium nitride (GaN) wafer



Features

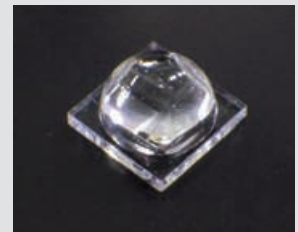
Created with proprietary liquid phase epitaxial growth technology, our GaN wafer has achieved low defect density over the entire wafer surface. GaN wafer-based substrates can deliver ultra high brightness for lasers and LEDs.

Major applications



Ultra high brightness lasers and LEDs are expected to be employed for projectors, stadium lighting and other purposes that require higher light intensity than can be provided by conventional models.

Micro-lens for UV LED lights



Features

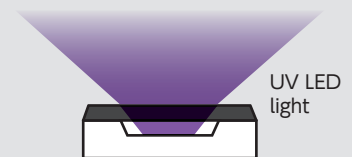
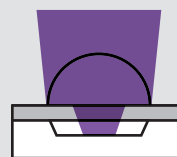
For the purpose of increasing the use efficiency of ultraviolet (UV) LED lighting, a high-quality complex-shape fused quartz micro-lens has been created by employing our proprietary manufacturing technologies.

Major applications

Micro-lens mounted on a UV LED light (for sterilization)

[With micro-lens]
UV LED light can condense light to demonstrate stronger sterilization power.

[Without micro-lens]
UV LED light is distributed widely, resulting in lower sterilization efficacy.



Currently, mercury-vapor lamps are the most popular light source for the purposes of resin cure, sterilization and purification. However, the use of mercury will be restricted from 2020, as stipulated in the Minamata Convention on Mercury. UV LED is expected to be a major alternative light source.

The Ceramic Battery Project

The Ceramic Battery Project was launched in April 2016, bringing together members from Corporate Manufacturing Engineering, Corporate R&D, the relevant business division and the head office to engage in commercialization-related activities aimed at earlier market introduction.

Chip-type ceramic secondary battery



Features

- Crystallographically-oriented ceramic positive electrode plate (Basic patented)
- Super-thin chip, high energy density, high temperature durability

Major applications



Zinc secondary battery



Features

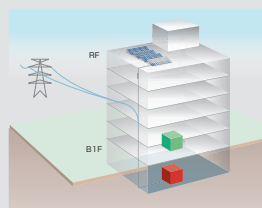
- Proprietary ceramic separators of solid electrolyte (new material)
- Water-based electrolyte (high safety), high-capacity, room-temperature functionality

Major applications

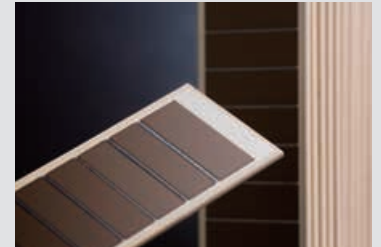
Residential power storage systems (10 kWh class)



Indoor-type power storage systems (500kWh class) (for office and other buildings, medical and commercial facilities)



Solid oxide fuel cell (SOFC) module



Features

- Proprietary structure and materials (ceramics)
- Compact, high power generation efficiency, high durability

Major applications

Fuel cell systems for individual and collective housing (each unit)



Strengthening Marketing and Prototype-related Functions

In order to develop new products and businesses in effective response to market needs, we are strengthening marketing and prototype-related functions. In fiscal 2016, customer contact opportunities were increased to achieve substantial information exchange. Also, we organized collaborative activities involving NGK's head office and business divisions and Group companies throughout the year.

Creating a constant stream of new products

- Conduct research activities to accurately grasp market needs
- Strengthen proposal-making capabilities



03 Strengthening Global Business Management

Thorough Compliance

We have introduced international-standard competition law compliance programs to establish a group-wide system for thorough compliance. Under the system, various initiatives are conducted to raise the awareness of officers and employees at all Group companies in and outside of Japan, including regular messages from management leaders and the creation of the Competition Law Compliance Handbook in multiple languages based on local legislation.

Providing compliance training at all Group companies in and outside of Japan

- Introduce international-standard competition law compliance programs



Enhancing Head Office Capabilities

To accelerate global business development, the head office is required to perform highly specialist and strategic functions to assist business divisions, thereby underpinning the growth of the entire Group. To build head office capabilities to buttress a global enterprise, we will hold rigorous discussions

and focus efforts on selected themes, such as global personnel development and deployment and actions to reduce increasing legal risks. Also, we are carrying out measures to eliminate operational waste and allow employees to focus on truly important tasks.



- Improve specialist functions
- Enhance capabilities to flexibly respond to changes

Enhancing head office functions to support global business development

- ✓ Support safety and health activities at Group companies in and outside of Japan
- ✓ Support technological development through promoting thorough improvement of IP research and analysis systems
- ✓ Support CSR-compliant procurement at Group companies in and outside of Japan
- ✓ Support compliance promotion activities at Group companies in and outside of Japan

04 Promoting Personnel Development and Work Style Reform

Personnel System Reform

To continually pursue global expansion and the creation of new products and businesses, it is essential to raise employee motivation and provide a workplace where each employee can fulfill their potential. Based on this belief, we have reformed personnel systems. Key reforms include lifting the mandatory retirement age up to 65 from the current 60, with the salary level unchanged, to offer senior personnel opportunities to work for longer and with a sense of security.

Younger/Mid-career personnel

Encouraged to aim at a higher job grade/position



Senior personnel

Can choose to work longer with a sense of security up to the retirement age of 65



Enhancing employment systems and women's career activities



MHLW's Eruboshi certification obtained for promoting women's career activities