

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.

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 2020

Transparency is the key to improving our quality of operation

Initiatives for Fiscal 2020

In fiscal 2019, we further built upon the quality of operation^{*1} initiatives begun in the previous fiscal year by instituting training aimed at boosting senior management's awareness, as well as strengthened the system to reflect contractual specifications into operations. These initiatives have led to continued improvement in quality of operation among NGK's various business divisions and to more widespread adoption of quality of operation improvement activities.

In fiscal 2020, we expanded the scope of training aimed at boosting managers' awareness to also include section managers and supervisors. We also made a concerted effort to foster an environment where employees are encouraged to voice their concerns.

With regard to product quality, we are working to strengthen business department-led implementation of ongoing QRE-P^{*2} efforts.

Additionally in fiscal 2020, we sought to ensure that organizational culture reforms take hold by establishing quality objectives, which promote problem awareness and place positive value on problem identification.

^{*1} Quality of operation: Level of operational systems that are in place to ensure that promises made to customers are fulfilled.

^{*2} 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.

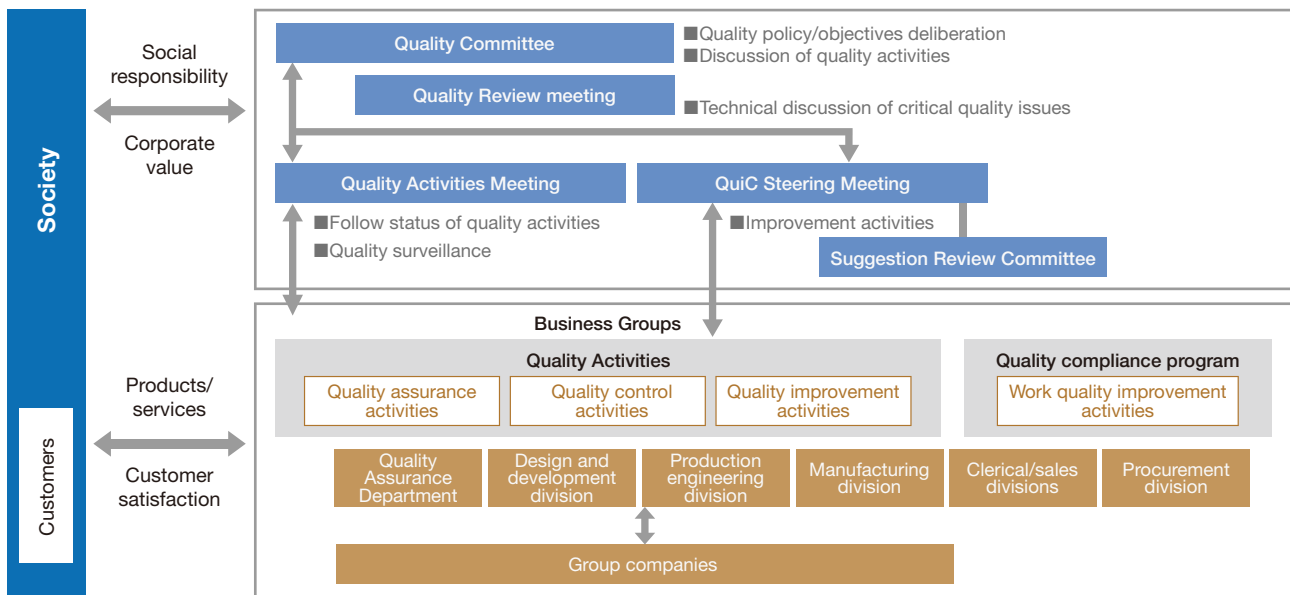
Quality Activity System

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.

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 “quality of operation” as well as “product quality”.

As a result of crisis management revisions implemented in fiscal 2020, in the event that a serious quality issue arises that involves legal, ethical, or other such concerns, it will be dealt with by the Quality Committee Chair in conjunction with the relevant committee. 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.

Quality Activity System



Acquisition of ISO 9001 or IATF 16949 Certification

	FY2015	FY2016	FY2017	FY2018	FY2019
Percentage of ISO 9001 certified sites (% Group)	100	100	97	97	97

Note: NGK Ceramics (Thailand) Co., Ltd. has been preparing to obtain certification since fiscal 2017.

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.

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.

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.

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.

*Design review

Rule for handling major customer complaints

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.

Seeking Greater Effectiveness from Quality Activities and Innovation in Operational Procedures

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 2019, we added Guidelines for Quality Risk Prevention in New Product Development to the company-wide regulations in order to better facilitate quality risk elimination during new product development by the Research and Development Division and others. Two quality assurance review meetings were held in accordance with these guidelines. The findings of not only the developer but also those of numerous experts were collected, so that robust discussion about quality risk elimination could be carried out prior to the product being used on the market.

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.

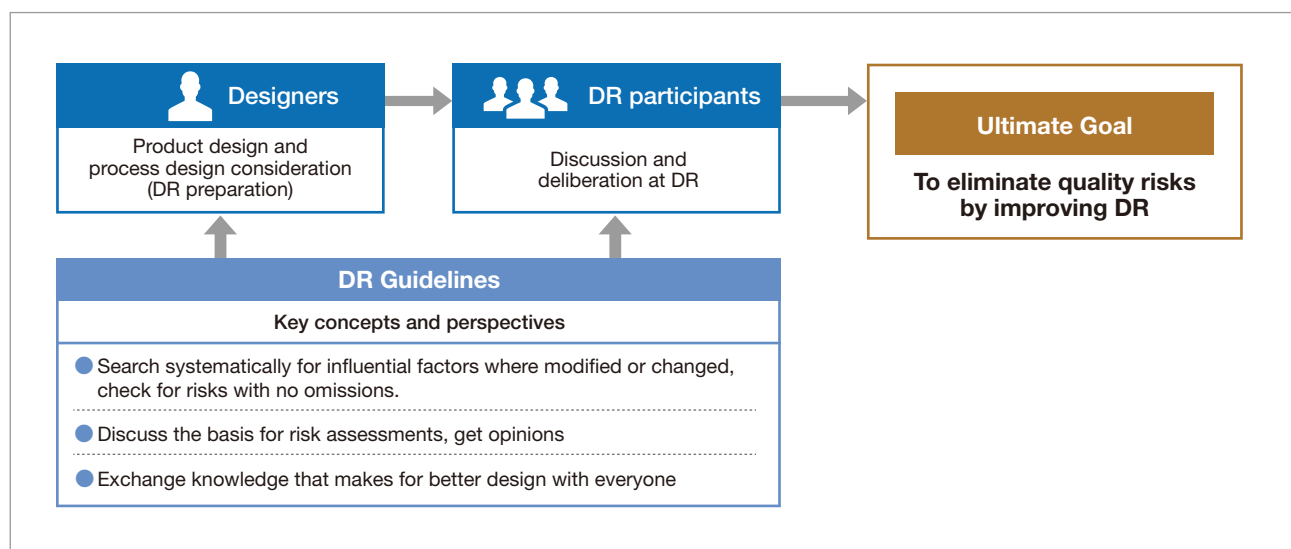
Activities to Strengthen DR Functions

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.

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 Production Bases outside Japan

From their inception, production bases outside Japan 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 Production Bases outside Japan

In fiscal 2019, quality compliance-related education seminars were held at six NGK Group companies in the U.S. as part of quality of operation activities focused on maintaining and improving the operational systems that are in place to ensure that promises made to customers are fulfilled.

The issue of the NGK Group's non-conformity in delivery testing procedure of insulators, along with the initiatives undertaken and rules put in place in response, was presented to the attendees in order to foster greater understanding of, and recognition about the importance of, quality compliance.

Expanding Improvement Activities to Production Bases outside Japan

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

For the overseas training in 2019 we visited Group company ACE in Belgium and implemented the following:

- Team discussion and a presentation to local staff on the topic of "What is 'improvement'?—proposals and small groups"
- Toured the factory with local staff and discussed how to identify problems and solve them
- Presented examples of improvement



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 2019, the contest was held over two days, and was divided between manufacturing and non-manufacturing divisions.

For the manufacturing division contest, 13 practices were introduced, including those from six Group companies in and outside Japan. The non-manufacturing division contest began with a keynote speech in the morning about how to create a “self-propelled” organization. This was followed in the afternoon by the introduction of eight non-manufacturing practices, including those from three Group company teams. Around 700 NGK Group employees and executives attended the competition.

Suggestion Activity Participation Rate

	FY2017	FY2018	FY2019
Manufacturing divisions	98%	100%	98%
Non-manufacturing divisions	93%	92%	85%
Clerical divisions	–	–	60%
Number of suggestions	Approx. 38,000	Approx. 28,000	Approx. 29,000

Manufacturing Division

At the manufacturing division contest held on July 10, ACC won the Grand Prize for successfully improving testing capacity, along with lowering the incidence of defects, to accommodate growing demand.



Non-manufacturing Division

At the non-manufacturing division contest held on July 16, the President's Special Award was presented to NGK Adrec for enlisting the help of sales and manufacturing divisions in sorting through the build-up of unneeded part numbers and implementing a smart product control system.



Sending Award Recipients and Outstanding Proposal Commendation Recipients to Training in and outside Japan

Training at a Group Company outside Japan

From the end of October to the beginning of November, four fiscal 2018 QuiC Outstanding Proposal Commendation recipients and two fiscal 2019 QuiC Grand Prize recipients visited NGK Group company ACE in Belgium. There, the visitors and local employees presented and discussed best practices and mutually reinforced the importance of pursuing operational improvement.

Training in Japan

In late December, six fiscal 2018 Outstanding Proposal Commendation recipients and 13 fiscal 2018 QuiC Excellence Award and Special Award recipients visited Okinawa to attend a nationwide QC Circle Conference and participate in discussion sessions about the differences between NGK and other companies, among other topics.

Group Company outside Japan

Local staff and team members take part in a training session at ACE



Training in Japan

Team members sent to attend the nationwide QC Circle Conference



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.

Quality-Related Education in FY2019

Program name	Number of days and participants	Objective
QCI	3-day lecture, 1 consultation session, 1-day report session, total approx. 40 days; 51 manufacturing staff members in their 3rd year and 80 mid-career hires	Perform data-based decision-making and QC7 tools exercises; carry out QC story-guided problem-solving procedures
QCI Training for Group Companies	2-day lecture, 3-day consultation session, 1-day report session, total 11 days; Soshin Electric (Nagano and Miyazaki): 8 people in total	QCI level problem-solving practical training implemented by NGK
Quality Basic II	4-day lecture, 3 guidance sessions, 1-day report session, total approx. 45 days; 62 engineering staff members in their 3rd year + 2 Group company staff members	Outside and in-house instructors provide instruction in statistical approaches to quality control and oversee exercises in applying them to business task-specific problem-solving
Learning from Failure and Methods of Creation	1.5-day lecture, 4-day exercise, 1-day presentation session, total 6.5 days; total of 155 participants	Lecture and exercises that teach analysis and application skills useful for learning from failure Supplemental special lecture focused on common examples of organizational failure provided in order to facilitate reorientation in thinking among management
Prevention Training	1.5-day lecture; total of 16 participants	Develop an understanding of product liability laws, including how such laws have been applied in specific B2B cases Understand basic approaches to preventive action and recurrence prevention; understand risk elimination procedures
	Issue examination and discussion: 0.5 days × 4 groups; total of 20 participants	Operational systems improvement training based on participants' work challenges and aimed at stimulating prevention activities
QMS Training	Lecture on ISO/IATF standards: 1 day for each; total of 340 participants	Develop an understanding of the intent and key requirements of standards
	Lecture on ISO/IATF standards: 2 days for each; total of 122 participants	Cultivate and certify internal quality auditors
	Strengthening internal auditing capability: 1 day; 38 participants	Building up process auditing ability for improved QMS effectiveness and greater quality compliance awareness
	VDA6.3 process auditing: 1 day; 33 participants	Develop an understanding of process auditing required by VDA standards

Points of Strengthening Quality-Related Education

QMS Training

We provide training aimed at helping personnel be able to more effectively capitalize on internal audits and, thereby, improve the effectiveness of quality management systems and increase awareness and knowledge of quality compliance. In fiscal 2019, we worked together with outside instructors to prepare skills enhancement courses tailored to internal auditors within the NGK Group, and, based on the positive response received from course participants, we will continue to develop them further.

77 Employees Pass Self-Maintenance Expert Test (Grade 1: 31 Employees, Grade 2: 46 Employees)

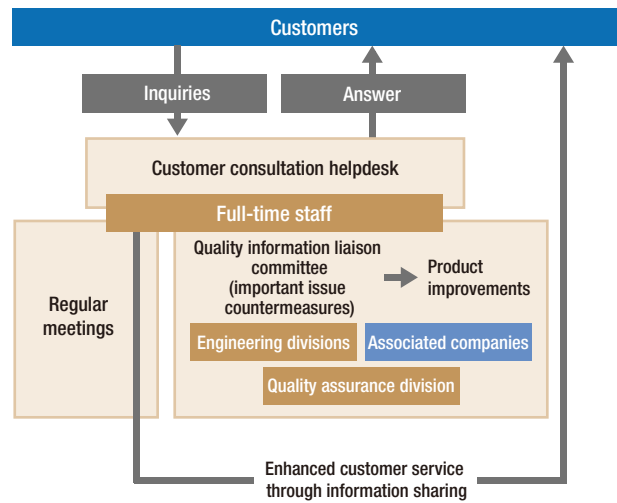
Seventy-seven manufacturing division and engineering center employees who are engaged in NGK's voluntary maintenance activities passed the Self-Maintenance Expert Test (Japan Institute of Plant Maintenance) conducted in October (Grade 1: 31 employees, Grade 2: 46 employees). This qualification is given 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 has mechanisms for reflecting customer feedback.

We set up an C1 inquiry service for customers to reflect customer feedback in our products and services. During fiscal 2019, we received around 6,000 inquiries via phone and e-mail on various issues, including product performance, installation methods, and requests for brochures, 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.

