NGK INSULATORS

CORPORATE PROFILE

WE SUPPORT

NGK has signed onto the United Nations Global Compact with 10 principles focusing on human rights, labor, environment, and anti-corruption. The NGK Group is conducting business in a manner consistent with these principles, with the aim of attaining a sustainable society.

Printed in Japan
2308 1K

Corporate Outline

Company name	NGK Insulators, Ltd.	
Address	2-56 Suda-cho, Mizuho, Nagoya 467-8530, Japan Telephone + (81) 52-872-7181	
Establishment	May 5, 1919	
Top Management	Chairman	Taku Oshima
	President	Shigeru Kobayashi
	Executive Vice President	Chiaki Niwa
	Executive Vice President	Ryohei Iwasaki
Business	Manufacture and sale of electric power related equipment including insulators, and of ceramic catalyst carrier for exhaust gas purification, and of industrial products, and of beryllium copper products	

【 Environment Business Group 】

Manufactures and sells HONEYCERAM® ceramic substrates for automotive catalytic converters, diesel particulate filters (DPFs) and gasoline particulate filters(GPFs) for removing particulate matter (PM) from vehicle exhausts, and in-vehicle high-precision NOx sensors

【 Digital Society Business Group 】

Manufactures and sells ceramic susceptors for semiconductor production equipment, reaction chamber parts, bonded wafers, piezoelectric micro-actuators for HDDs, translucent alumina ceramics, ceramic packages, and beryllium-copper and copper-nickel-tin products

【 Energy & Industry Business Group 】

Manufactures and sells products supporting stable electricity supply including insulators, equipment for power transmission/substation/distribution, and NAS® battery, as well as industrial equipment and facilities including kilns, drying furnaces, refractories, ceramic filters, separators, corrosion-resistant equipment, and low-level radioactive waste treatment systems

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.

The NGK Group Philosophy is a signpost that guides every employee of the NGK Group. Formulated in 2019 to mark our 100th anniversary, it encompasses our desire to use our proprietary ceramic technology to contribute to future energy, environmental protection, and industrial progress, and to help people around the world live a happy, comfortable life.

▸NGK Group Philosophy

NGK Group Vision: Road to 2050

The NGK Group Vision announced in 2021 presents a picture of
'what we want to be' by 2050 along with the path we will take to get there.
For NGK Group, 2021 is the year of our 'Third Foundation'
as we pursue the self-transformation that will enable us to realize our vision.

What we want to be

A company to contribute to carbon neutrality and digital society with our unique ceramic technologies

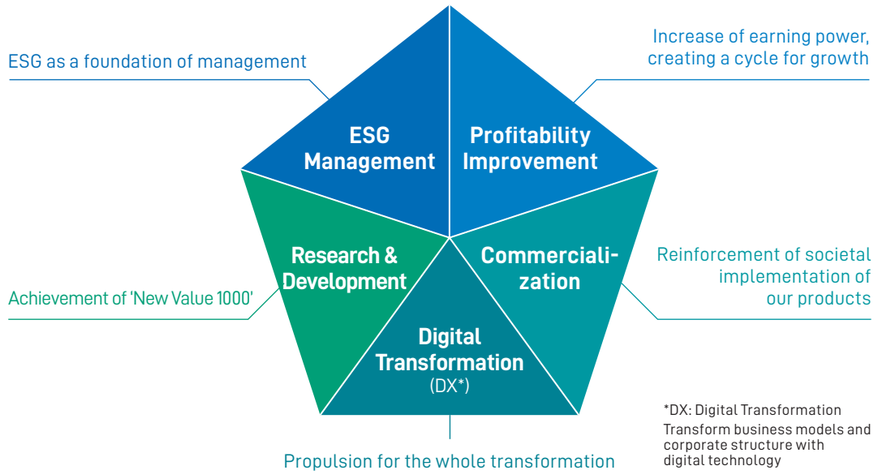
What we must do

Convert our business structure through 5 Transformations

This Medium- to Long-term Vision outlines the kind of society we may attain by 2050 and positions the shift to carbon neutrality and a digital society as the most urgent issues we need to work on. The vision also identifies five areas of transformation that must be achieved: (1) ESG Management, (2) Profitability Improvement, (3) R&D, (4) Commercialization, and (5) Digital Transformation. Specific goals include realizing net zero CO_2 emissions by 2050 and developing new technologies and products for the areas in focus. The NGK Group will continue to build on its unique ceramic technology to create value in various forms, enabling sustainable business growth and contributions to society.

▸ NGK Group Vision
▸ NGK Group Environmental Vision
▸ NGK's SDGs

5 Transformations



ESG Management	Our foundation of management is to contribute to society through our business as a member of society. In particular, with regard to E (Environmental), we have formulated the 'NGK Group Environmental Vision' along with the 'NGK Group Vision.' In that Environmental Vision, we stipulate our targets as contributing to carbon neutrality through products and services as well as achieving net zero CO_2 emissions in our own activities by 2050.
Profitability Improvement	Regarding improvement in earning power, we are going to take on the following initiatives: -Generating cash by securely increasing our earning power over the next five years -Instilling management utilizing ROIC and analysis and improvement of profitability in each business within the entire NGK Group -Starting new actions in production processes to continue to reinforce our strengths as a manufacturer
Research & Development	We will aim and work on to create a business with sales of 100 billion yen by 2030 through new business development, which we call 'New Value 1000.' In order to achieve this, we will invest 300 billion yen in R&D over the next 10 years with 80% allocated to carbon neutrality and digital society.
Commercialization	In order to make ceramic products born from our strength more widely used in society, we will focus on expanding to solution business, not limited to just selling things, by improving our marketing capabilities and expanding collaboration with the outside partners.
DX	We will use the power of digital to accomplish the above business transformation.

NGK Group Vision: Road to 2050

Carbon Neutrality × Digital Society

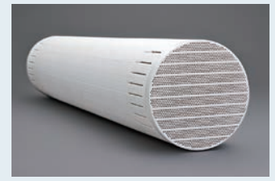
NGK Group will contribute to carbon neutrality and digital society with our unique ceramic technologies.

CN
Carbon Neutrality

Contributory products

NAS® battery

Zinc rechargeable battery



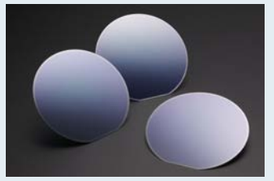
Subnano-ceramic membranes

DS
Digital Society

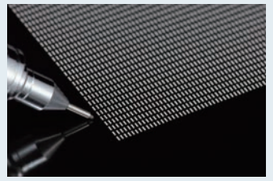
Contributory products

Lithium-ion rechargeable battery “EnerCera®”

Ceramic heaters



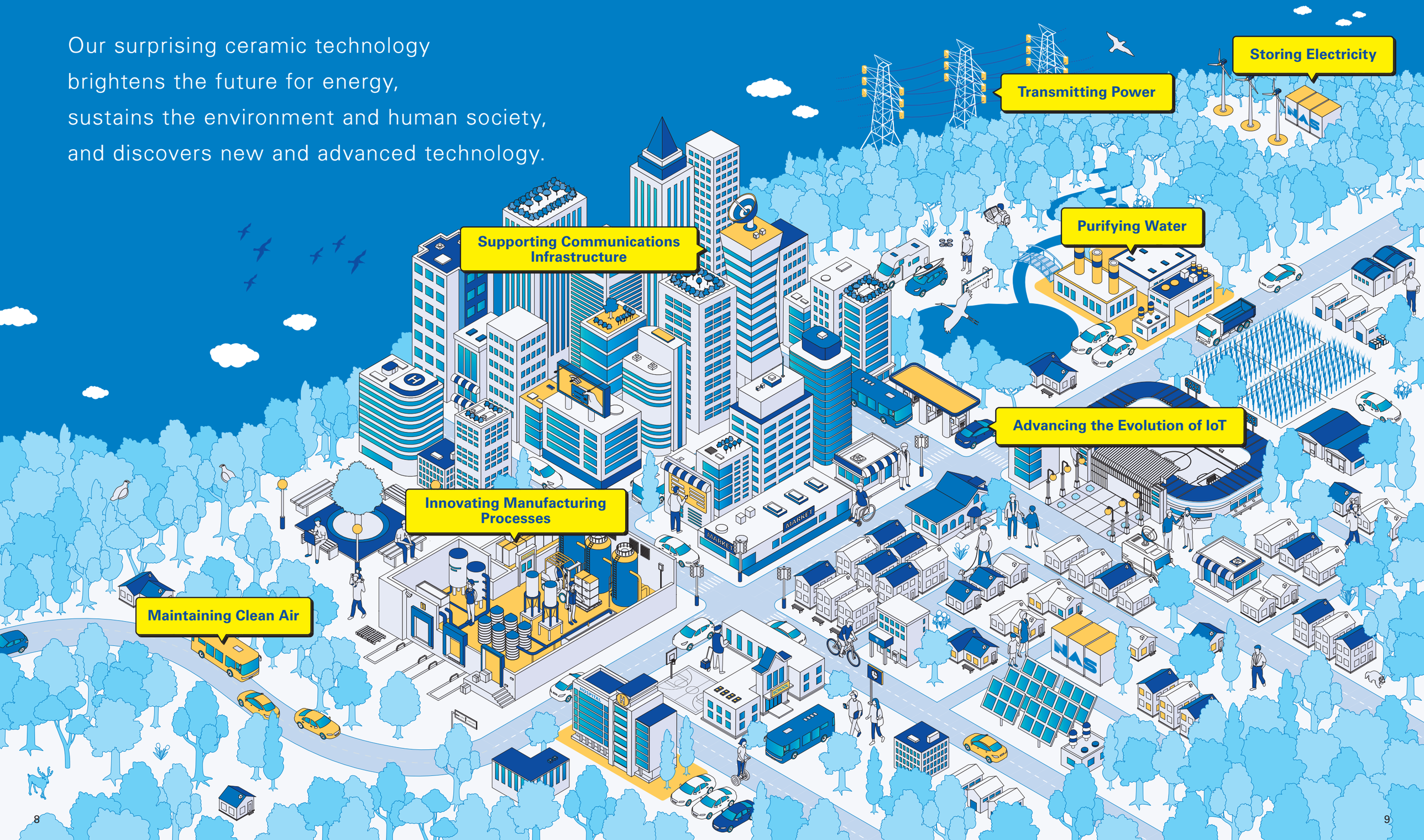
Bonded wafers



Piezoelectric micro-actuators for hard disk drives (HDDs)

Surprising Ceramics.

Our surprising ceramic technology
brightens the future for energy,
sustains the environment and human society,
and discovers new and advanced technology.



Environment Business Group

Maintaining Clean Air

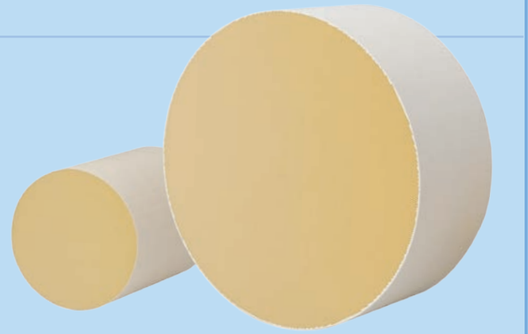
We respond to increasingly stringent emission regulations through our world-leading technology for purifying automobile exhaust gas, contributing to environmental protection and enriching our life.

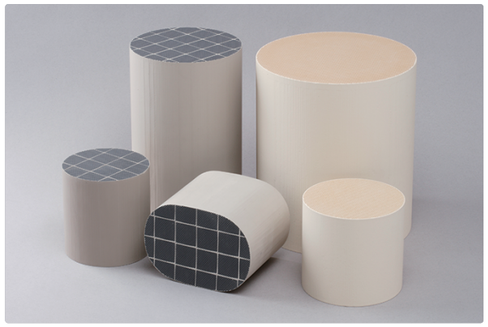
NGK's fine ceramic technology keeps satisfying the needs of the world

HONEYCERAM®
Ceramic substrates for automotive catalytic converters

Large-size HONEYCERAM (LSH)

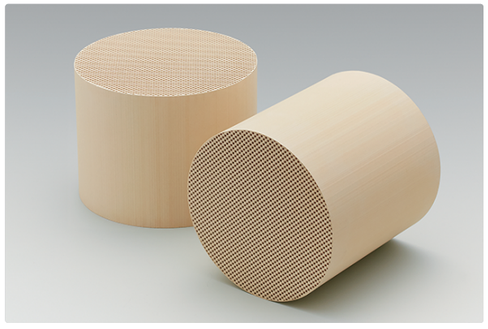
HONEYCERAM with a very compact installation has a honeycomb structure which covers an area equivalent to two soccer grounds. It can carry catalysts for neutralizing harmful substances in automotive exhausts. The product steadily meets ever more rigorous emission regulations and has been adopted by automakers around the world.





Diesel particulate filters (DPFs)

The filters are effective in catching particulate matter (PM) in their fine pores and remove up to 99% of PM, Highly heat-resistant silicon carbide (SiC) filters are used in passenger cars, while lightweight cordierite filters are mainly used in larger vehicles.



Gasoline particulate filters (GPFs)

GPFs are particulate filters for gasoline-powered vehicles. GPFs are adopted in gasoline direct injection vehicles that are powerful yet as fuel efficient as hybrid cars. Building on its DPF technology, NGK commercialized GPFs for the first time in the world.

In-vehicle high-precision NOx sensors

NGK developed and commercialized the world's first vehicle-mounted sensor capable of measuring nitrogen oxide (NOx) concentrations in automotive exhaust gas at the parts per million (ppm) level. Measuring real-time NOx concentrations and feedback enables precise control of the exhaust gas purification system to reduce NOx emissions.

SDGs pursued by Environment Business Group

▸ Products

Digital Society Business Group

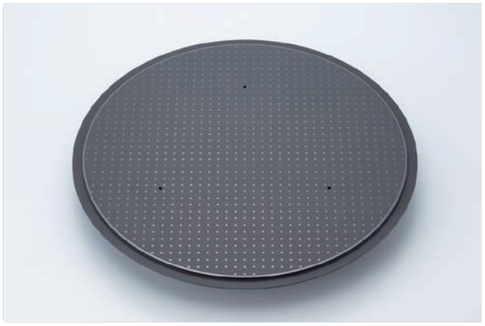
Responding to Challenges with Leading-Edge Technologies

In the rapidly advancing field of electronics, we are exploring unique technologies to address the issues of an ever-evolving digital society.

High-performance components that assure stable quality in semiconductor manufacturing processes

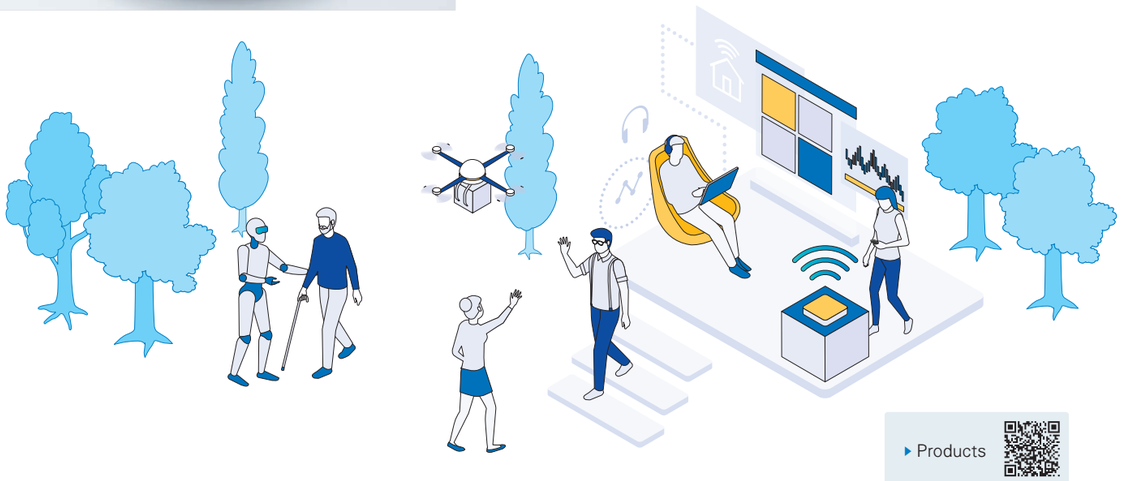
Ceramic heaters

Our ceramic heaters are used to uniformly control the temperature of silicon wafers in the deposition process. The unique structure of a shaft bonded to the bottom of the heated pedestal, where wafers are placed, protects terminals and conducting wires from halogen gas, supporting stable supply and technological advancement of semiconductor fields.

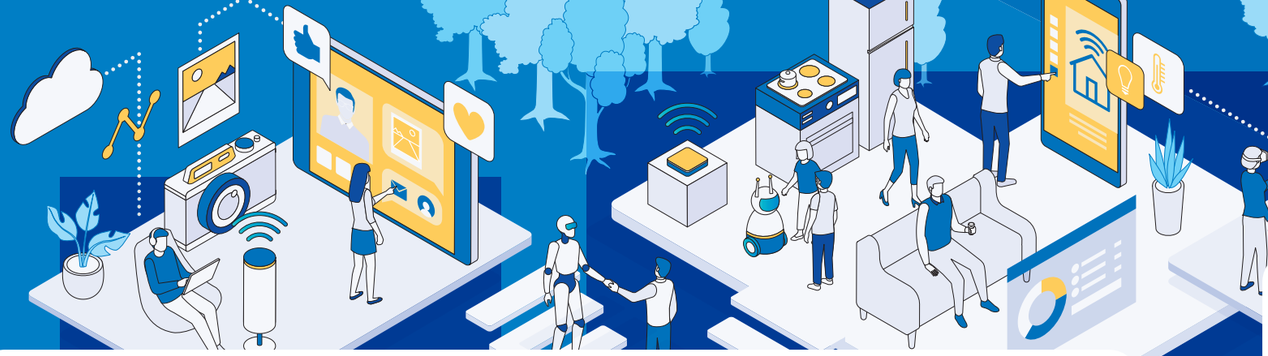


Electrostatic chucks

Electrostatic chucks are used to hold silicon wafers in place during etching and other processes. Our electrostatic chucks can be flexibly adapted to diverse purposes of use to significantly improve the efficiency of semiconductor production processes. For instance, they can be integrated with high-precision heaters or attached to cooling plates.



▸ Products



Enhancing the communication performance and speed of ICT devices

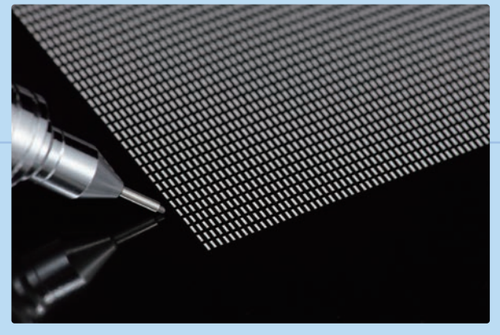
Bonded wafers

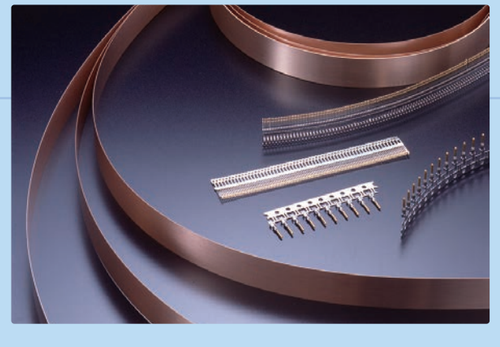
Drawing on its proprietary ceramic bonding technology and ultra-high-precision thin polishing technology, NGK manufactures bonded wafers specifically developed for use in electronic devices. Bonded wafers with layers of different materials can yield performance and functions that are not possible with single-material wafers.

The key device that enables large capacity and superior reliability in hard disk drives (HDDs)

Piezoelectric micro-actuators for HDDs

NGK's laminated piezoelectric actuators are among the smallest in the world, and they can precisely control the magnetic head of HDDs. They have been instrumental in boosting the capacity and reliability of HDDs, and are now active in data centers around the world.

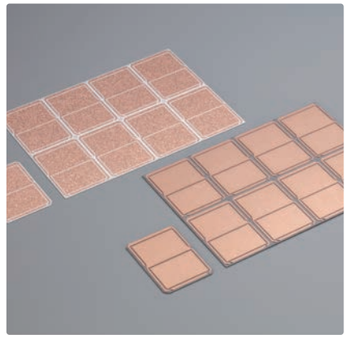




Making electronics components smaller, lighter, and more reliable

Beryllium copper products

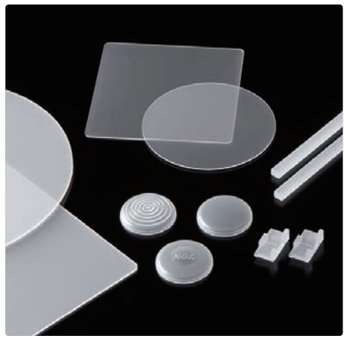
Beryllium copper alloy features excellent electrical and thermal conductivity of copper coupled with superior strength and durability comparable to special steel products. Beryllium copper strips are used as high-performance conductive springs in many advanced applications, including cars, industrial equipment, home appliances, and mobile devices.



DCB*1 and AMB*2 substrate

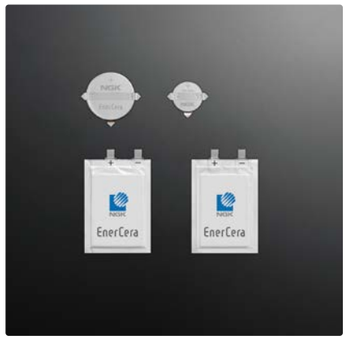
These circuit substrates combine the superior heat dissipation and electrical conductivity of copper with the excellent insulation performance of ceramics. They can carry large electrical currents and exhibit high dielectric strength, and can be optimally designed for such use environments as industrial machinery and automobiles.

*1 DCB: Direct Copper Bonding
*2 AMB: Active Metal Brazing



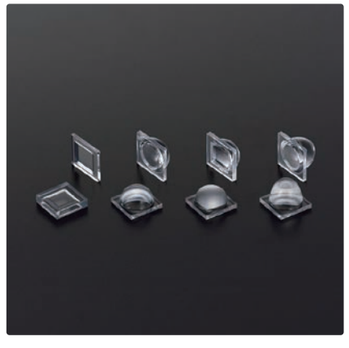
Translucent alumina ceramics

Translucent alumina ceramics superior translucence and high strength are achieved by sintering high-purity alumina ceramics at high density. These are used in diverse products, mainly for the substrates in semiconductor chip packaging process where outstanding reliability is required.



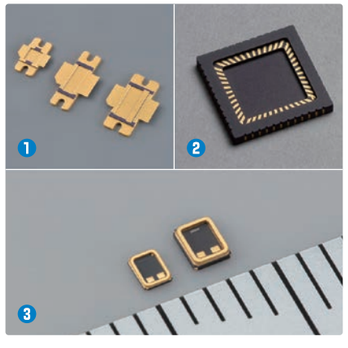
Lithium-ion rechargeable battery "EnerCera®"

Using NGK's proprietary crystal-oriented ceramic plates as electrodes, these small and thin lithium-ion batteries feature high energy density. It can produce large enough current to support wireless communication, and can be mounted on devices through high-temperature processes due to its high heat resistance. It is expected to boost the widespread adoption of IoT devices and other next-generation appliances.



Micro-lenses for ultraviolet LEDs

These micro-lenses adjust the irradiation area of ultraviolet LEDs—which are used in sterilization, hardening of resins, etc.—to enhance their effectiveness. Micro-lenses for ultraviolet LEDs may be used as a light source to replace mercury lamps at water treatment plants and also in equipment such as air purifiers.



Ceramic packages

Ceramic packages for high frequency (RF) devices (1) manufactured and sold by NGK Electronics Devices have the top share in the world. The company also produces and sells ceramic packages for CMOS image sensors (2) and crystal packages (3), among many others.

Copper-nickel-tin products

Composed of adding nickel and tin to copper, this high-performance alloy has excellent characteristics comparable to beryllium copper, as well as high heat resistance and wear resistance. It is widely used for contact springs, bearings, etc.

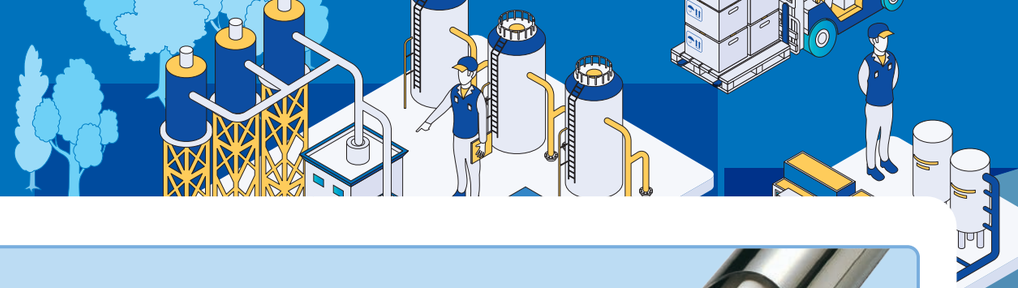
SDGs pursued by Digital Society Business Group

▸ Products

Energy & Industry Business Group

Supporting Global Power Supply and Advances in the Industry

We ensure stable electricity supply and explore new potentials for energy, transforming a wide range of industrial segments including the chemical and pharmaceutical industries.



The world's first large-capacity energy storage system contributing to further diffusion and development of renewable energy

NAS® battery

With an array of superior features, including large capacity, high energy density, and long service life, the NAS battery systems can produce high output of electric power for long periods of time. The battery systems have already been utilized in many locations with wide range of applications such as leveling the load peaks, spreading the use of renewable energy, etc.

Insulators

The insulators play a critical role in supporting transmission lines and steel towers and equipments insulated. NGK offers the products of uncompromising quality capable of withstanding the harshest conditions such as earthquakes, typhoons, and heavy accumulations of snow, ensuring the safe and secure supply of electricity.

Hot-line insulator washing equipment

Hollow insulators, station post insulators, bushings, and other devices are used at substations. Dust and salt tend to accumulate on the surfaces of insulators installed close to the sea or in an industrial area, which can lead to flashovers. The hot-line insulator washing equipment uses water jet spray to clean the insulators so they can maintain their performance.

NAS, HONEYCERAM and EnerCera are trademarks of NGK INSULATORS,LTD., registered in the United States.

Corrosion- and heat-resistant ceramic membranes with excellent separation performance

Ceramic membranes and separators

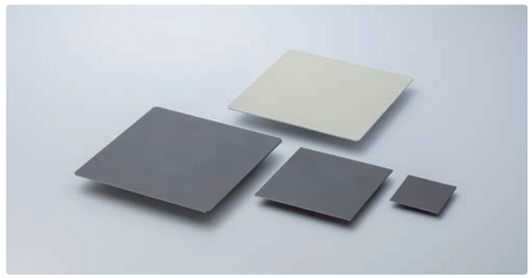
Ceramic membranes feature excellent separation and filtering performance, making them suitable for the sterilization of mineral water and the solid-liquid separation of various substances, from organic solvents to viscous liquids including honey. The superior separation performance of these filters creates new possibilities for engineering.

Low-level radioactive waste treatment systems

This system safely treats low-level radioactive wastes from nuclear power facilities using NGK's proprietary incineration and exhaust gas treatment technologies. Coupled with wide-ranging engineering support and maintenance services, the system effectively and reliably removes radioactive materials from wastes, contributing to the safe operation of nuclear power facilities.

Industrial heating systems (kilns and drying furnaces)

NGK's proprietary heating and drying technologies are used in industrial heating systems that cover a wide range of temperatures. They are used in advanced applications, including kiln firing of lithium-ion battery parts and electronic components and drying of functional films and gold foils.



Refractory products

NGK's refractories include jigs for firing ceramic parts and electronic components. Notable among these is the exceptionally thin and lightweight silicon carbide (SiC) refractories which can save energy and boost the performance and productivity of final products.

Corrosion-resistant equipment and systems

NGK manufactures exceptionally corrosion-resistant pumps and valves for chemical, pharmaceutical, and steel industries where heated acids and organic solvents are used in chemical processes. NGK also manufactures glass linings that prevent electrostatic charges and ensure safety.

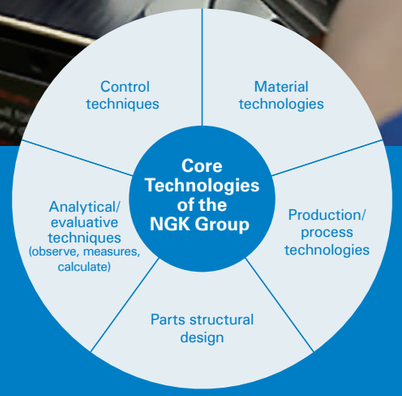
SDGs pursued by Energy & Industry Business Group

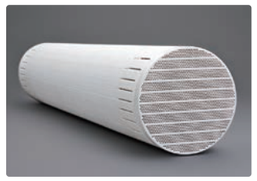
▸ Products

Creating the Future with the Potentials of Ceramics

NGK Group is committed to achieving Carbon Neutrality and a Digital Society through the tireless pursuit of new technologies that can change the world.

From its very beginning, the NGK Group has sought to reexamine conventional ceramic manufacturing practices in light of the latest science and technologies 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.





Subnano-ceramic membranes

Zinc rechargeable battery

Lithium-ion rechargeable battery “EnerCera®”

Gallium nitride (GaN) wafers

▸R&D ▸The NGK Group’s Core Technologies

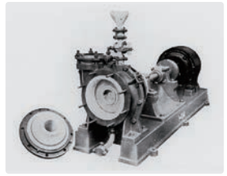
It Started with a Fragment of Insulator

When electricity was beginning to be widely spread in Japan during the Meiji Period (1868-1912), all high-voltage insulators were imported. Kazuchika Okura, who later became the first president of NGK Insulators, decided that insulators should be manufactured in Japan, declaring that “we do this for the sake of society’s future, and not for our own profit.” A study of special high-voltage insulators followed, which started with the examination of a fragment of a U.S.-made insulator and resulted in the establishment of NGK Insulators. Ever since then, the company has embraced original ceramic technologies as its core, responding to the needs of society through cutting-edge manufacturing and contributing to the advancement of the world.

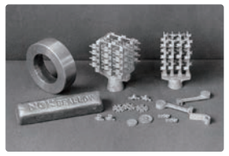
The fragment of insulator that played a part in the foundation of NGK Insulators (1905)

Year	Event
1919	NGK INSULATORS LTD. was established as a spin-off of Insulator Division in Nippon Toki, Ltd. (now Noritake Co., Limited)
1923	Bushing production operations began.
1929	1,000 kV-class high voltage insulator testing facilities were completed.
1931	Started production and marketing of sulfuric acid corrosion-resistant apparatus for the chemical industry.
1935	Exported suspension insulators to India, marking the start of full-scale product export.
1958	Started manufacture and sale of beryllium copper products.
1965	NGK INSULATORS OF AMERICA, LTD. (now NGK-LOCKE, INC.) was established in the U.S. as the first overseas marketing company.
1968	High Voltage Laboratory was completed.
1971	Started manufacture and sale of translucent alumina ceramics.
1973	LOCKE INSULATORS, INC. was established in the U.S. as the first overseas production base (now closed).
1976	Started manufacture and sale of ceramic substrates for automotive catalytic converters HONEYCERAM®.
1978	Delivered the first low-level radioactive waste treatment systems.
1986	Characters used in Japanese company name changed; English name remained the same.
1989	Started production of diesel particulate filters (DPFs).
1995	Delivered UHV transmission gas bushings that were among the largest in the world (11.5 m in length).
1996	Started mass production of ceramics for semiconductor manufacturing equipment. Started development of vehicle exhaust gas NOx sensors.
1998	Established NGK Foundation for International Students.
2003	Started mass production of NAS® battery system.
2007	Developed subnano-ceramic membranes that were among the largest in the world.
2012	Started production of gasoline particulate filters (GPFs).
2014	Started production of bonded wafers.
2015	Started mass production of piezoelectric micro-actuators for hard disk drives (HDDs).
2016	Started mass production of copper-nickel-tin products.
2018	Commercialized gallium nitride (GaN) wafers and micro-lenses for ultraviolet LEDs.
2019	Established NGK Group Philosophy. Commercialized Lithium-ion rechargeable battery “EnerCera®”.
2021	Formulated NGK Group Vision: Road to 2050 as a mid-to long-term vision. Cumulative production of HONEYCERAM reached 1.8 billion units.
2023	Revised the NGK Group Corporate Business Principles and established the NGK Group Code of Conduct

A special high-voltage insulator made around the time the company was founded.

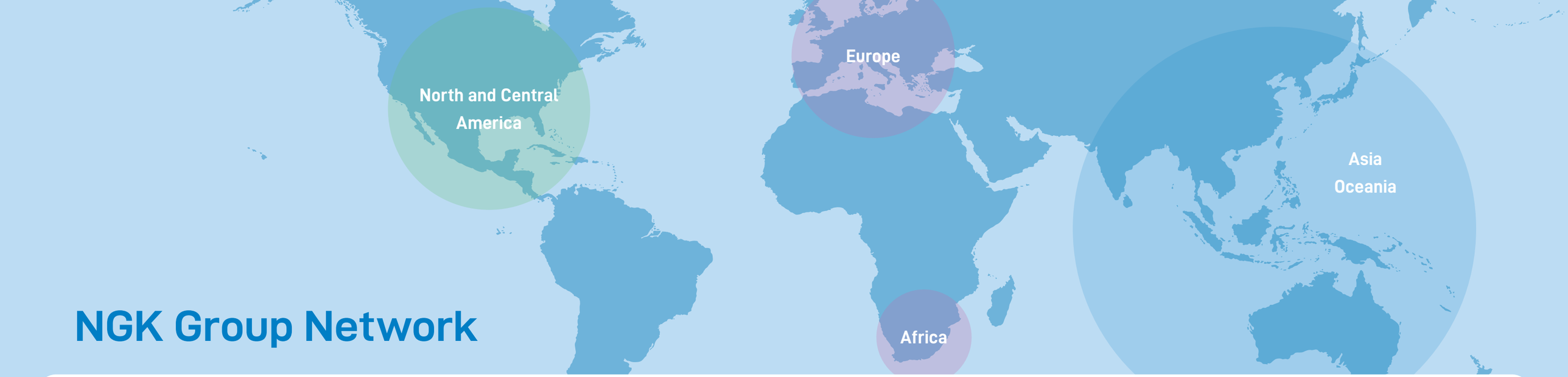


Sulfuric acid corrosion-resistant apparatus (1931)



Beryllium copper products (1958)

The first unit of HONEYCERAM that came off the production line in 1976. This item has been registered as an essential historical material for science and technology by the National Museum of Nature and Science in 2009.



NGK Group Network

Japan

NGK INSULATORS, LTD.

2-56, Suda-cho, Mizuho-ku, Nagoya, 467-8530

Headquarters / Nagoya Site

Chita Site / Komaki Site / Ishikawa Plant

Tokyo Main Office / Osaka Branch / Sapporo Sales Office / Sendai Sales Office
Hokuriku Sales Office / Hiroshima Sales Office / Takamatsu Sales Office / Fukuoka Sales Office

NGK OKHOTSK, LTD.
Manufacture of jigs for producing ceramic products, etc.
Environment

NGK METEX CORPORATION
Processing of beryllium copper products
Digital Society

NGK CERAMIC DEVICE CO., LTD.
Manufacture of ceramics for automobiles and semiconductor manufacturing equipment, electronic functional components, etc.
Environment Digital Society

NGK FINE MOLDS, INC.
Manufacture and sale of metal molds
Digital Society

NGK ELECTRONICS DEVICES, INC.
Manufacture and sale of ceramic packages, DCB and AMB substrates, electronic functional components, etc.
Digital Society

ABASHIRI ELECTRIC POWER CO., LTD.
Generation and sale of power from solar panels and NAS® battery
Energy & Industry

▸ Network

ENERGY SUPPORT CORPORATION
Manufacture of insulators for power distribution and other ceramic products
Energy & Industry

AKECHI INSULATORS, LTD.
Manufacture of insulators for power distribution and other ceramic products
Energy & Industry

ENA ELECTRIC POWER CO., LTD.
Generation and sale of power from solar panels and NAS® battery
Energy & Industry

NGK CHEMITECH, LTD.
Design, manufacture, sale, and maintenance service of glass linings and corrosion-resistant pumps and valves
Energy & Industry

NGK FILTECH, LTD.
Design, manufacture, and sale of pharmaceutical water purification systems and membrane filtration systems
Energy & Industry

NGK KILNTECH CORPORATION
Design, manufacture, and sale of industrial heating systems
Energy & Industry

NGK ADREC CO., LTD.
Manufacture of refractory products
Energy & Industry

NGK LIFE CO., LTD.
Insurance agency
Management of golf course business

NGK YU-SERVICE CO., LTD.
Welfare services
Management of tennis club business
Building management/maintenance services

NGK LOGISTICS, LTD.
Transport/storage of products, raw materials, and facilities

NR-POWER LAB CO., LTD.
Business development related to VPP and digital electricity services

Environment Environment Business Group
Digital Society Digital Society Business Group
Energy & Industry Energy & Industry Business Group

North and Central America

NGK CERAMICS USA, INC.
Manufacture of automotive ceramics
Environment

NGK AUTOMOTIVE CERAMICS USA, INC.
Sale of automotive ceramics
Environment

NGK METALS CORPORATION
Manufacture and sale of beryllium copper products
Digital Society

FM INDUSTRIES, INC.
Metal parts processing, coating and assembly for semiconductor manufacturing equipment
Digital Society

NGK ELECTRONICS USA, INC.
Sale of ceramics for semiconductor manufacturing equipment
Digital Society

NGK-LOCKE, INC.
Manufacture and sale of insulators and other products related to power supply
Energy & Industry

NGK CERAMICS MEXICO, S. DE R. L. DE C. V.
Manufacture of automotive ceramics
Environment

Europe, Africa

NGK BERYLCO U.K. LTD.
Processing and sale of beryllium copper products
Digital Society

NGK CERAMICS EUROPE S.A.
Manufacture of automotive ceramics
Environment

NGK EUROPE GMBH
Sale of automotive ceramics, etc.
Environment Digital Society

NGK DEUTSCHE BERYLCO GMBH
Sales support of beryllium copper products
Digital Society

NGK BERYLCO FRANCE
Manufacture and sale of beryllium copper products
Digital Society

NGK CERAMICS POLSKA SP. Z O.O.
Manufacture of automotive ceramics
Environment

NGK CERAMICS SOUTH AFRICA (PTY) LTD.
Manufacture and sale of automotive ceramics
Environment

Asia, Oceania

NGK (CHINA) INVESTMENT CO., LTD.
Sales support of insulators and other products related to power supply, beryllium copper products, and ceramics for semiconductor manufacturing equipment
Digital Society Energy & Industry

NGK CERAMICS SUZHOU CO., LTD.
Manufacture and sale of automotive ceramics
Environment

NGK TECHNOCERA SUZHOU CO., LTD.
Design, manufacture, and sale of industrial heating systems
Energy & Industry

NGK AUTOMOTIVE CERAMICS KOREA CO., LTD.
Sales support of ceramics for automobiles and semiconductor manufacturing equipment, electronic functional components
Environment Digital Society

P.T. NGK CERAMICS INDONESIA
Manufacture and sale of automotive ceramics
Environment

NGK CERAMICS (THAILAND) CO., LTD.
Manufacture and sale of automotive ceramics
Environment

SIAM NGK TECHNOCERA CO., LTD.
Manufacture and sale of refractory products
Energy & Industry

NGK TECHNOLOGIES INDIA PVT. LTD.
Sales support of automotive ceramics and beryllium copper products
Environment Digital Society

NGK STANGER PTY LTD.
Manufacture and sale of power distribution equipment, sale of insulators for power substations/transmission
Energy & Industry