

What's Next?

GROWTH

Growing dramatically through advanced technologies and superior qualities.

Our automotive components include spark plugs which hold the world's largest market share. All of our components are highly acclaimed by automotive manufacturers across the globe. Our main strengths are advanced technological capabilities and outstanding qualities. Today, the automotive industry is in an era of a new innovation and a growth spurred by the development of next-generation vehicles and the rapidly accelerating motorization of emerging nations. Moving forward, NGK SPARK PLUG will use advanced technologies and superior qualities as leverage for developing new markets and entering new fields.

Spark Plugs



High-End Plugs for Aftermarket

Premium RX series plugs are the highest grade spark plugs for Automobiles and have a ruthenium center electrode and a ground electrode with a projected platinum tip to ensure excellent ignitability and combustion efficiency. Iridium MAX series plugs, meanwhile, have an iridium center electrode and a platinum tip on the ground electrode, providing long life. IRI series plugs are also available for modified engines.



Spark Plugs for Automobile and Motorcycle

NGK Spark Plugs include green plugs, projected plugs, multiple ground electrode plugs and precious metal plugs for Automobile use. Smaller diameter long-reach plugs and Bi-Hex plugs engineered to meet diversification of the engine are also available.

For Motorcycle, spark plugs which thread diameter is 10mm or 8mm are used to suit the engine design.



Spark Plugs for Racing

Racing spark plugs have been designed to withstand severe operating conditions, such as high combustion temperatures and pressures. Their superior performance has been proven in motorcycle and car races in the world, including Formula One, World Rally Championship and MotoGP.



Spark Plugs for Marine Engine and Agricultural Equipment

Various spark plugs are available, including compact plugs for chain saws and lawn mowers, and surface-discharge plugs for outboard motors.



Glow Plugs for Diesel Engine (Ceramic Type)

Ceramic-type glow plugs, which have ceramic heater elements inside the heating section, deliver excellent heat resistance and long durability. They contribute to shortening of engine start time by fast heating, and improvement of engine emissions through high temperature post-heating (NHTC™). We also offer NHTC™ 2 glow plug that can minimize pre-glow time.



Glow Plugs for Diesel Engine (Metal Type)

Metal-type glow plugs have heating coils inside heat-resistant metal tubes. Two types of metal glow plugs are available; Self-Regulating Metal (SRM) glow plug, which can be used under battery voltage at post-heating period, and Advanced Quick Glow System (AQGS™) glow plug, which shortens engine start time by fast-heating. Fast-heating type has higher post-glow temperature and contributes to improve emissions.

Plug-related Products

**Igniter Plug for Gas Turbine**

These igniter plugs for gas turbines ignite with more than 100 times powerful spark compared with those for automobiles. This is because reliable startability and reliability are required for gas turbines that can be used by various fuels, such as city gas, light oil, heavy oil, and so on.

**Igniter Plug for Rocket**

Igniter plug for rocket is installed in the combustion chamber near the supply ports of hydrogen and oxygen, therefore it use silicon nitride insulator that can withstand thermal shock of combustion.

**Igniter Plugs for Aircraft**

This plug is designed with a high-purity aluminum insulator and a special alloy so that it can withstand high spark energy, high voltage, high temperature, and high-pressure gas.

**Quick Glow System (QGS™)**

Electrical control systems for glow plugs to improve startability at low temperatures and improve exhaust emissions in diesel engines.

**Ignition Coil for Gas Engine**

This ignition coil has sufficient discharge characteristics and is highly reliable. NGK adopts a special out molding structure to ensure high reliability.

**Spark Plug Cap and Cable for Motorcycle and General-Purpose**

This product suppresses electromagnetic interference generated by the engine's ignition system. It includes motorcycle and general-purpose spark plug caps as well as motorcycle racing cables, caps and cables. We also have power cables for motorcycles. These power cables delivers ultra-low resistance of 0.5kΩ (0.9kΩ/m) along with superb ignitability and acceleration.

**Spark Plug Cable for Automobile**

NGK cables for automobiles are highly effective in suppressing electromagnetic interference generated by the engine's ignition system. The coil-type resistor cables offer excellent conductivity, while the power cables exhibit an ultra-low resistance of 0.9kΩ/m providing improved startability and acceleration with reduced spark energy loss.

**Ignition Coil for Aftermarket**

This product converts the in-vehicle battery supply voltage into high voltage with appropriate timing and immediately for discharge of spark plugs.

What's Next?

BREAKTHROUGH

Harnessing the power of ceramics to make breakthroughs. New values for industries and daily lives.

By utilizing ionic conductance, thermal resistance, corrosion resistance, electric insulation, biocompatibility and other properties of ceramics, we develop products to enrich industries and daily lives.—These are the mission of the NTK brand. Our business covers a wide range of fields from sensors, electronic parts and cutting tools to bioceramics and lifestyle goods. We will continue to apply our acquired material technologies and process technologies in order to provide high value-added products which meet the needs of the times.

Sensors and Plug-related Products



OZAS®-S
(Zirconia Exhaust Gas Oxygen Sensor)

OZAS®-S controls air-fuel ratio for exhaust gas clarification, as a central component of emissions treatment systems. It generates 0 or 1V according to the oxygen concentration in exhaust gas. And it starts working quickly after engine start-up, even in cold weather conditions, thanks to its early activation capabilities.



ZFAS®-U
(Universal A/F Heated Exhaust Gas Oxygen Sensor)
XCU®-UA
(ASIC for ZFAS-U)

ZFAS®-U generates an output signal corresponding to the exhaust gas O₂ concentration. It detects a wide range of air-to-fuel ratios for precise stoichiometric and lean burn control to keep exhaust clean. This high performance is realized by combining the sensor with XCU®-UA.



OZAS®-S
(Small Heaterless Type Oxygen Sensor for Motorcycles)
ZFAS®-S
(Small Heated Type Oxygen Sensor for Motorcycles)

OZAS®-S and ZFAS®-S are sensors which have achieved smaller and lighter designs and high vibration resistance considering harsh environmental conditions for motorcycles.



ZFAS®-N2 (NOx Sensor)

This sensor can measure NO_x concentration and oxygen concentration in the exhaust gas simultaneously in high-precision. It is built into the NO_x after treatment system of gasoline lean burn engine or a diesel engine, by which is used for system control support and OBD, and will contribute to fuel efficiency and clean air. M18 fixed screw type or M20 spinning screw type are available.



CTAS®-T
(Wide Range Temperature Sensor)

Detects a wide range of temperatures, from low temperatures up to 950°C. With a highly heat resistant element made from electro-conductive ceramic, or platinum and an easily-modified design, can be installed anywhere in the exhaust system, including the catalyst case. Achieves high reliability under severe conditions like high temperature and vibration.



ERAS®-K (Knock Sensor)

Piezoelectric ceramic sensor for the detection of vibration caused by engine knocking. Knock sensors are used for ignition timing control that contributes to engine performance, fuel economy, and engine protection when feeding low octane fuel.



Glow Relay Unit (GRU)

It is a controller that can stabilize plug temperature and improve emissions through PWM control when used together with fast-heating type glow plugs. It also has failure diagnosis function.



Glow function Integrated Pressure Sensor (GIPS)

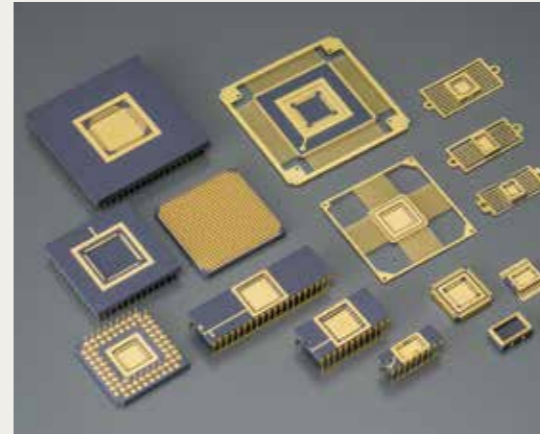
The pressure sensor integrated inside the glow plug is able to measure combustion pressure in the engine. Improved exhaust gas emission, lower fuel consumption, compensation for ignition delay on low quality fuel and other wide variety of effects are expected by feedback control of fuel injection based on combustion pressure signal.



NCEM® compact multi-gas Measure system / PM/PN sensor

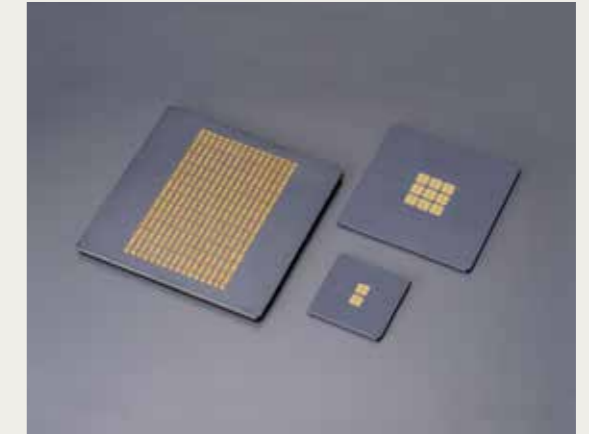
NCEM is a compact and light exhaust gas measurement system that is able to measure the exhaust gas during on road drive. It can measure PM/PN, NO_x and O₂, and measurements can be performed in real time by installation directly in the exhaust gas flow.

Semiconductor Packages and Substrates



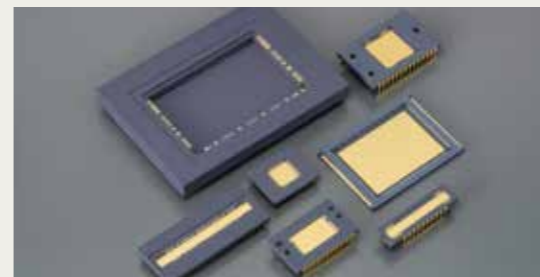
High Temperature Co-Fired Ceramic (HTCC) Packages and Substrates

Developed with high performance ceramics, NTK HTCC packages and substrates realize highly reliable and durable semiconductor devices even in severe environments.



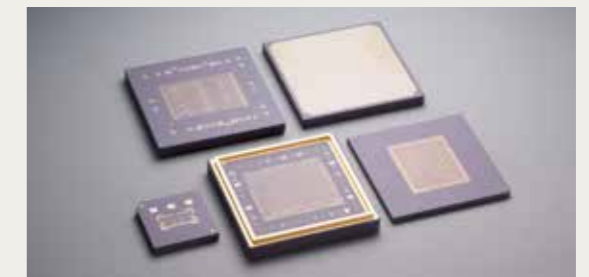
Large-Scale Substrates for Wafer Testers

The large scale ceramic substrate with high density routing and numerous pads geometry is designed for semiconductor wafer testing probe card. NTK's well-established design capability and production system deliver quality product in short production time to support the fast-paced semiconductor industry.



Packages for Image Sensors

Image sensing is now absolutely imperatives in our life. With its low thermal expansion, low dusting and mechanical shock stability, ceramic is an optimal packaging solution for image sensors.



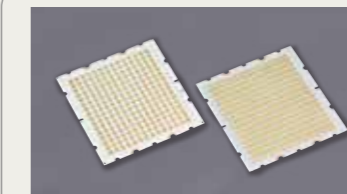
Flip Chip Packages for High Reliability ASIC

High pin count & high routing density packages developed for devices used for aerospace/high reliability applications.



Ceramic Packages for Medical Applications

Multilayer ceramic packages support various devices for Medical applications such as medical analysis equipment and implant devices.



LED Packages

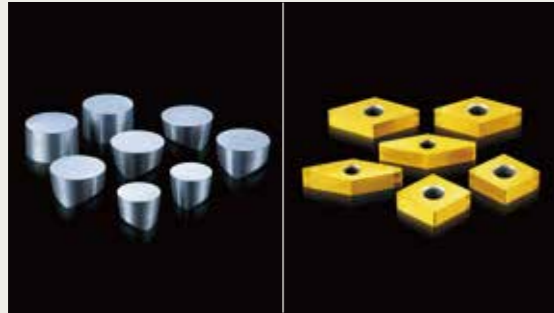
NTK's advanced ceramic material development capability and multilayer circuit board design flexibility supports LED's two technical challenges, further improvement of luminous efficiency and brightness.



Surface Mounted Packages for Electronic Devices

NTK's strictly controlled green sheets are laminated with high precision to contribute miniaturization of electronic devices such as Pressure Sensor, Infrared Sensor, Oscillator, RF filter and so on.

Cutting Tools



BIDEMICS

BIDEMICS is a revolutionary composite material that exceeds the performance of existing Cermet, CBN, and Carbide inserts. This family of grades effectively machines parts that are manufactured using Heat Resistant Super Alloys (HRSA) for Aerospace (ie. engine parts), Power Generation, and Oil and Gas industries.



SS Tools

NTK SS Tools feature tooling design for CNC Swiss Type Automatic Lathes. By replacement from conventional blazed tools to indexable tools, SS Tools provide high quality, high productivity and longer tool life in small parts machining.



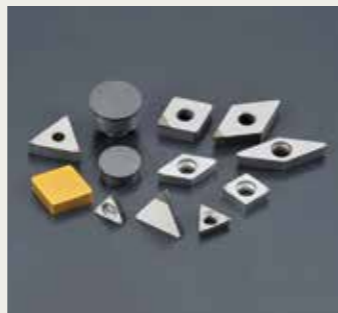
Cermet Grades

NTK Cermet is a standard insert grade which is suitable for semi-finish and finish turning of steel, general steel (carbon/ alloy steel), ductile cast iron and others, with longer tool life and better surface finish. PVD coated cermet has even better wear resistance.



Micro Grain Carbide Grades

Miniaturization of the main component WC hard grain realizes toughness and hardness, as well as outstanding cutting. Furthermore, PVD coated products offer superior wear resistance and welding resistance, which can be used for cutting a wide range of materials including copper, stainless steel, non-ferrous metals and materials for which machining is difficult.



Cubic Boron Nitride Grades

Formed using CBN (cubic boron nitride) and a special ceramic binder, this sintered compact maintains high hardness at both normal temperatures and high temperatures. There is also little chemical reaction with the work material. Accordingly, this sintered compact is optimal for high-speed finishing of ultra-hard materials and normal cast iron.



Throw-Away Drills

With drill holders that are compatible with a range of shapes and different kinds of drill tip coatings, these multi-purpose throw away drills can be used even with machines that have low horsepower or rigidity, due to its low cutting force. They have excellent chip control and provide accurate holes.



Indexable End Mills & Solid carbide End Mills

NTK's Indexable End Mills provide superior performance in tool life and material surface finish compared with HSS End Mills. Our new Solid Carbide End Mill series is perfect for small diameter end milling applications. The sharpness of these tools reduces burrs, produces remarkable surface finishes, and provides excellent tool life.



Cutter to Machine Aluminum

For processing of aluminum parts at machining centers (HFC, HPC, HSC, SFC, ALWC). Realizes high efficiency and reduced costs by adding an HPC and steel body (cutter diameter: φ40-100) to the conventional HSC and special aluminum body (cutter diameter: φ80-200).

Medical Products • Fine Ceramics



Oxygen Concentrator

A very energy efficient and quiet oxygen concentrator. It uses pressure swing adsorption to generate air with high oxygen concentration. The concentrated oxygen is used in home oxygen therapy, for patients suffering from chronic respiratory diseases and other ailments.



Bio Ceramics

New ceramics offer superior strength and biocompatibility, making them optimal for artificial bones and artificial hip joints. Bone paste is used in a clay-like state and then hardens with time to fill in a variety of damaged areas.



Bearing Balls

Bearing using silicon nitride is realizing high rigidity/insulation by reducing heating value caused by centrifugal force and lessening of the friction coefficient. They are used in ultra-precise high-speed bearings, heat resistant bearings, electric corrosion-resistance bearings and semiconductor equipment applications.



Electro-Static Chuck • Vacuum Chuck

Electro-static chucks are used for ETCH and CVD equipment. They have excellent plasma resistance and temperature uniformity, which contribute to microfabrication process of semiconductors. Vacuum chucks are used for lithography and wafer inspection, and nano-level surface finishing can be done.



Components for Semiconductor Production Equipment

Ceramics are used to build components requiring corrosion resistance, abrasion resistance, heat resistance, rigidity, and lightness of weight that are superior to metal, or for use in environments with heat-processing equipment, corrosive gases, or plasma.



Ceramic Heater

This heater is created by embedding a wire inside alumina ceramics and uniting the parts through sintering. Lightweight and possessing outstanding chemical resistance, the heater warms at a fast speed and realizes uniform temperature distribution. This technology enables an environmentally friendly and compact design.



Ultrasonic Sensor

Hermetically sealed for good antiweatherability. The various models cover various applications, such as industrial equipment, commercial equipment.



Ultrasonic Transducers

Uses a Langevin structure which efficiently generates ultrasonic vibrations. The transducer is clamped with a bolt to improve durability. Can be used in various fields including medical equipment and industrial equipment.



Igniter

Our igniter works with DC or AC current, is compact in size, and produces little noise. It is used in all kinds of gas devices, including gas stoves and water heaters.



Positioner

High reliable multilayer piezoelectric actuators are sealed to the housing of the metal. We have a variety of products for high temperature, large generated force, and small type.



Buzzer

We have circuit built-in small buzzer using the ultra-thin ceramics and waterproof, small buzzer with large volume by battery. These products suitable for alarm sounders such as safety box, vending machine and automobile.



Piezo Electric Element

PZT-based piezoelectric ceramic has a variety of Navy Type I, II and III. These ceramics are used in a wide range product areas such as general industrial products, automotive and medical.

*Vacuum chuck and Components for Semiconductor Production Equipment are our group company NTK CERAITEC CO., LTD's product line.