Towards the realization of a hydrogen society that will lead the next energy generation

Introduction of hydrogen-related products

Att. No.383E・01-2025

NOK Group contributes to carbon neutral future

NOK is Japan’s first Oil Seal manufacturer.

NOK's functional parts, manufactured with advanced technology, are used in a wide range of devices such as automobiles and home appliances, supporting society.

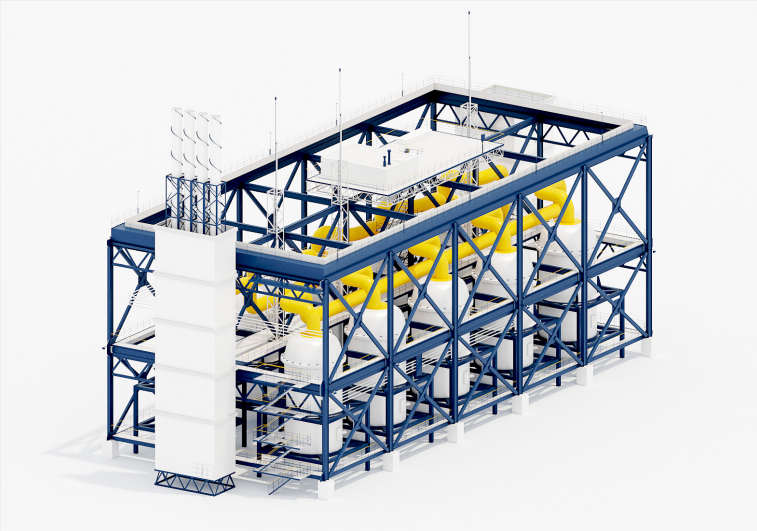
We provide products based on NOK's sealing technology and polymer compounding processing technology.

In addition, we are developing products with greater functionality and performance with a view to a carbon-neutral society of the future.

For NOK, the path to a hydrogen society has already begun!

PRODUCING HYDROGEN

We propose the most suitable rubber materials and product designs according to specifications and environmental needs.



WATER ELECTROLYZER

for WATER ELECTROLYZER

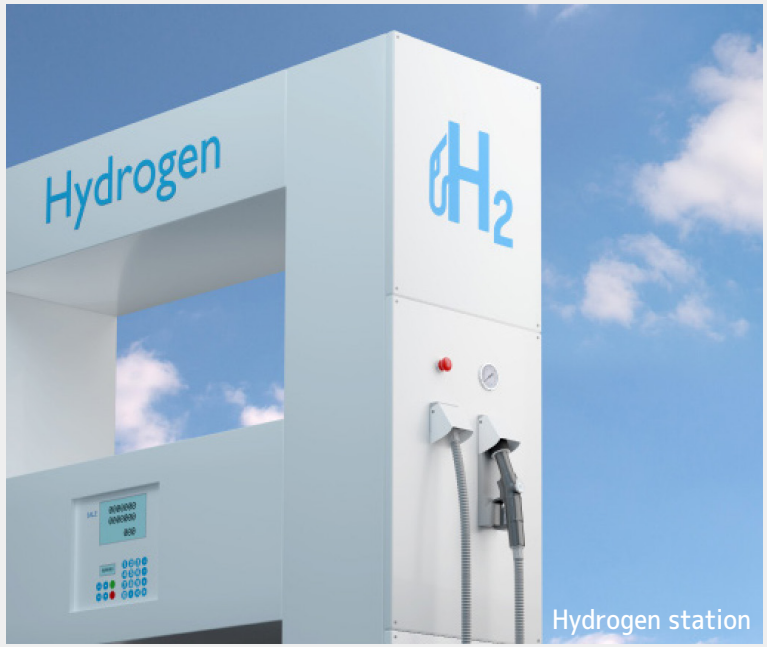
Rubber Gasket for Water Electrolyzers

for PIPING & HOSES

O rings

STORAGE & TRANSPORTATION of HYDROGEN

We provide products that can be used safely in hydrogen environments, high pressure, and extremely low temperature environments



Hydrogen station

for WATER ELECTROLYZER

O rings, Backup rings

for WATER ELECTROLYZER

Fluorine grease

for WATER ELECTROLYZER

Anti-Vibration products

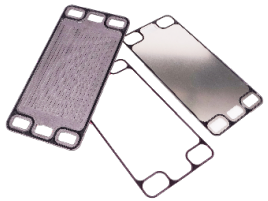
USE of HYDROGEN

NOK offer a wide range of products for FCVs (incl. commercial & industrial), Home Use FC, Marine and Railway

FCV

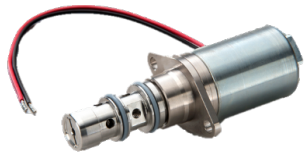

Home use FC

Fuel Cell Stacks


Fuel cell stack seals


Vibration control mounts

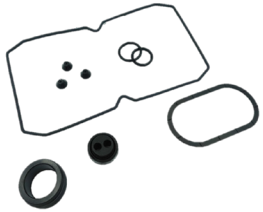
Hydrogen Supply


Hydrogen control valve

Humidifier


Humidifying membrane module

Invertor


Electromagnetic shield rubber

Improved workability

Hydrogen detection rubber

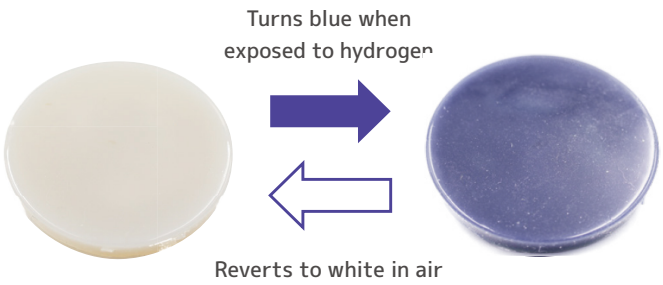
▶ Gas leaks can be detected at a glance with this reusable rubber

Water electrolyser | Hydrogen station | FCV etc

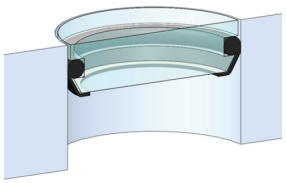
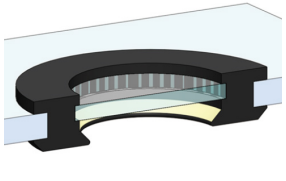
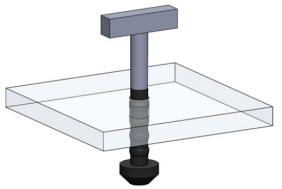
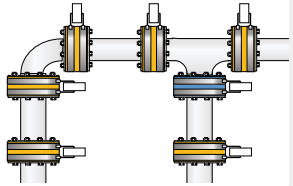
Hydrogen leaks can be visually confirmed by the discoloration of the rubber

Hydrogen discoloration

The color change is reversible, so it can be reused



Product specification example

Window specifications (1)	Window specifications (2)	Level gauge specifications	Application to piping
			
A window fits into the hole, and can be detected by the naked eye through the window	A window designed for a thin-walled housing, detectable by the naked eye through the window	Gauge specifications that allow visual observation by inserting and removing	By covering the pipe joints, workers can detect them with the naked eye

Contributing to simplified inspection and replacement

It can be molded into any shape, allowing you to create products to suit your needs

*The hydrogen detection rubber is a joint research and development product with Tokyo University of Science.

Integration & small section

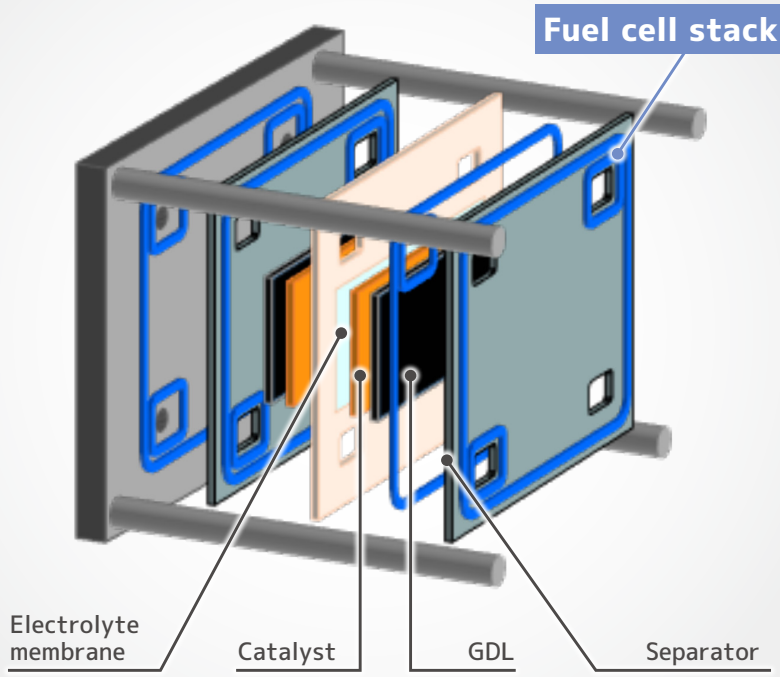
Fuel cell stack seals

FCV etc

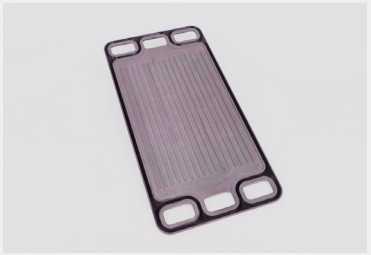
▶ **Reducing the number of parts and assembly man-hours by integrating various components with gaskets**

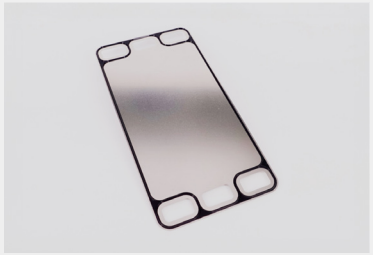
Sealing material that embraces characteristics such as heat resistance, cold resistance and low elution

Example of fuel cell structure

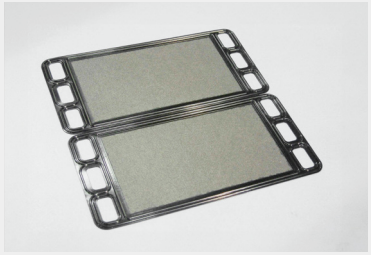


Examples of production


Seal integrated on carbon separator


Seal integrated on metal separator


Seal integrated on plastic film


Seal integrated on GDL
(GDL=Gas Diffusion Layers)

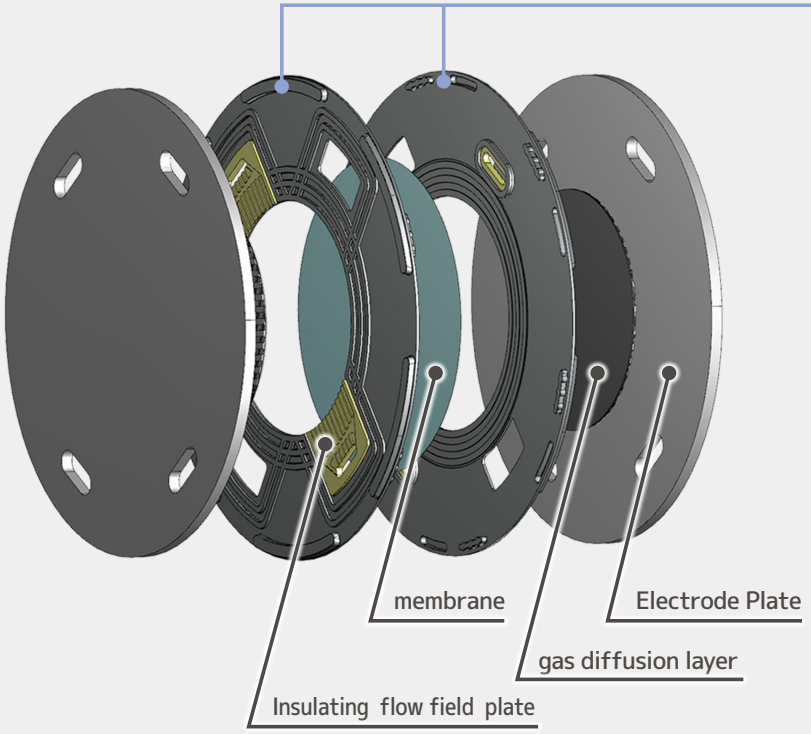
performance improvement

Rubber Gasket for Water Electrolyzers

▶ **Sandwiching the membrane between the gaskets makes it easy to replace the membrane and gaskets at the same time**

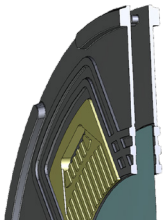
Water electrolyser

Gasket integrated with insulating flow field plate

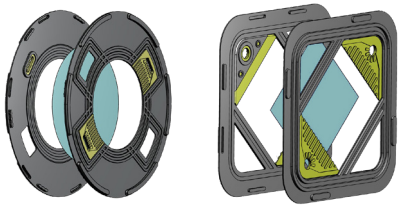


Rubber Gasket for Water Electrolyzers

・Same Pieces of Gasket.



・Round and square shapes are available.



High Pressure

・Self-seal enables high pressure application.

Module

・Gaskets integrates manifolds and membrane.
・Flow field plate reduces number of parts applied.

Maintenance

・Same pieces of gasket eases replacing membrane.

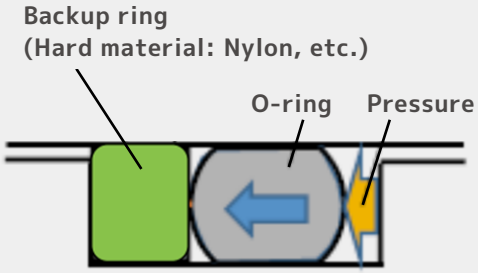
Hydrogen & high pressure resistance

O-ring for high-pressure hydrogen resistance

▶ Proposing rubber materials and backup rings according to specifications

Water electrolyser | Hydrogen station | FCV etc

O-ring that can be used under various conditions such as from medium and low pressure to high pressure parts



NOK recommended materials for hydrogen

Sealing object	Demand characteristics		NOK rubber material symbol (Hue)
Hydrogen(H_2)	Gas concealment	Heat resistance	F201(Black)/FL68(Black)
	Low-temperature properties		E116(Black)
		Low elution	E227(Black)/E700(Black)
		Pressure resistance	E619(Black)/E340(Black)
	Extremely low-temperature properties	Blister resistance	E9079(Black)/Special VMQ
Air	Ozon resistance	Low elution	E227(Black)
Pure water	Water resistance		
Methanol	Methanol resistance		

High durability & humidification performance

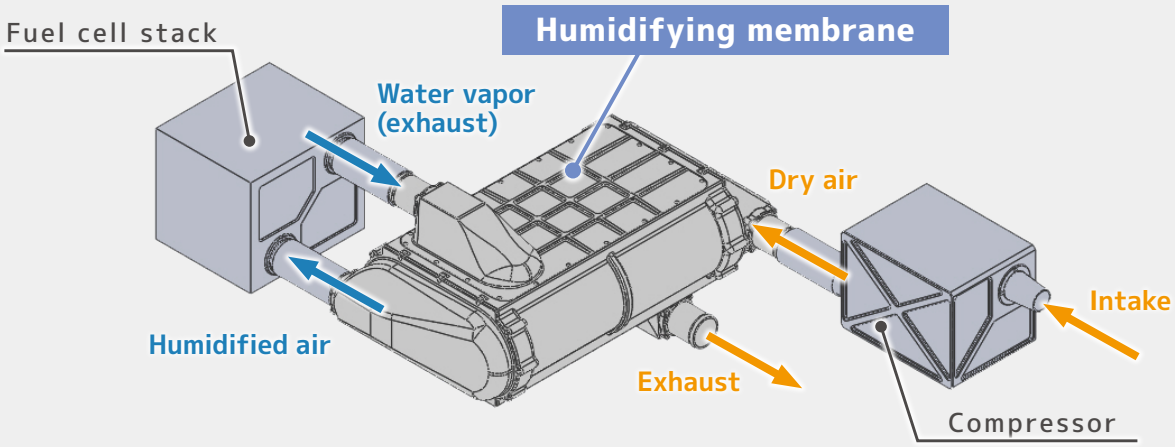
Humidifier

▶ Custom design and various reliability assessments are possible

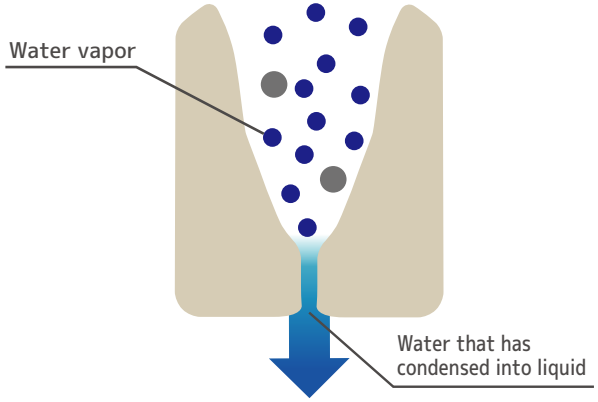
FCV etc

Hollow fiber membrane having high permeability, heat resistance and chemical resistance

Connection image with the fuel cell stack



Humidification Mechanism Model Diagram (Capillary condensation method)



Less contamination

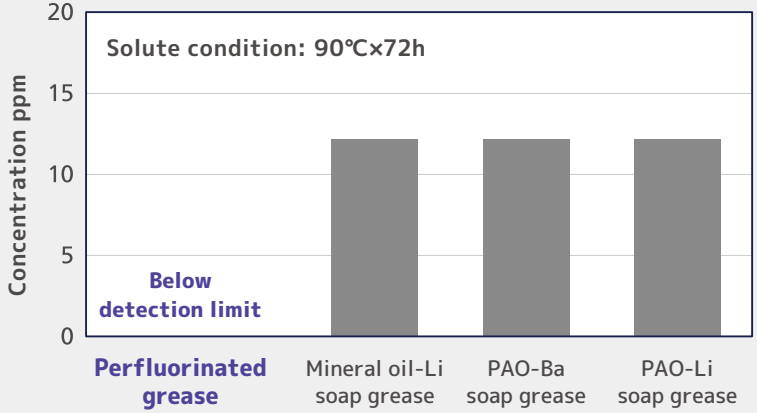
Perfluorinated grease for seals

▶ Contributing to reduction of seal insertion resistance and contamination caused by grease

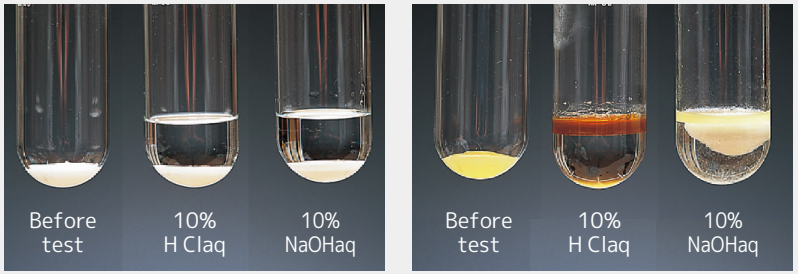
Water electrolyser | Hydrogen station | FCV etc

Grease with excellent chemical stability

Total organic carbon in water of each grease



Solubility to acid and alkali



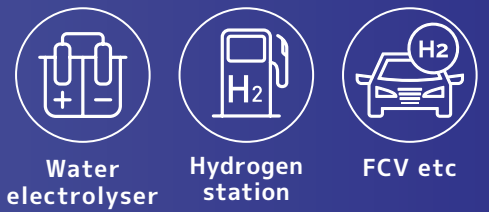
(Test condition: 70℃×24h)

Little elution into water, and does not dissolve in acids or alkalis

Performance Improvement

Perfluorinated grease“NOXLUB” KF 0323 for extremely low temperature applications

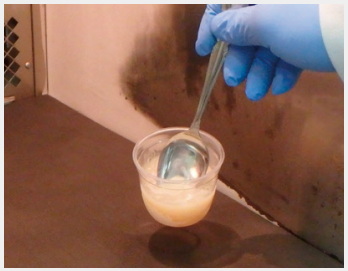
▶ Smooth even at very low temperatures (-80°C)! Achieves low torque



Ensure very low risk of leaching into water and wide service temperature range from -80 to 180°C by using selected fluorine materials

Confirmation of fluidity (tested at -40 °C)

Multi-purpose grease



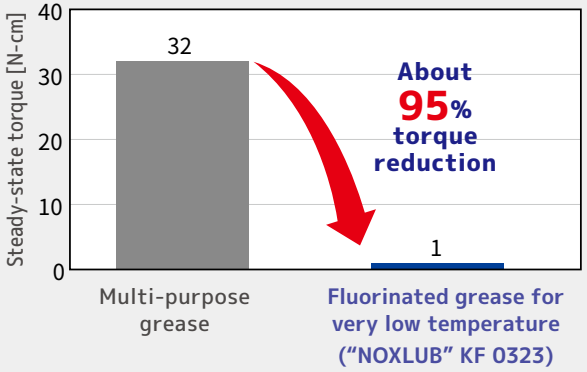
▶ Change to solid state

Fluorine grease for very low temperature

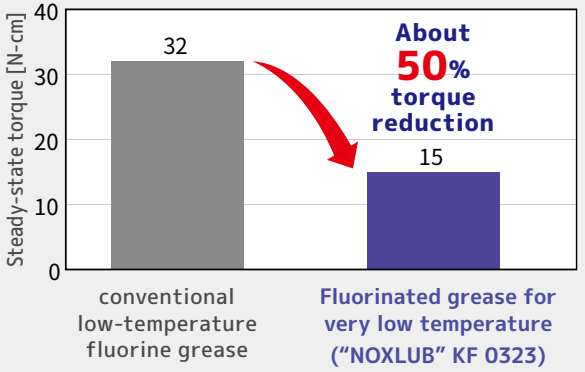
▶ Keeping Liquidity

low-temperature bearing torque test

Low Temperature Torque at -40°C
(JIS K2220.18)



Low-temperature torque at -75°C
(NOK Kluber original method)



Contribute to reduct energy consumption and increase safety of machinery opearated in low-temperature environments

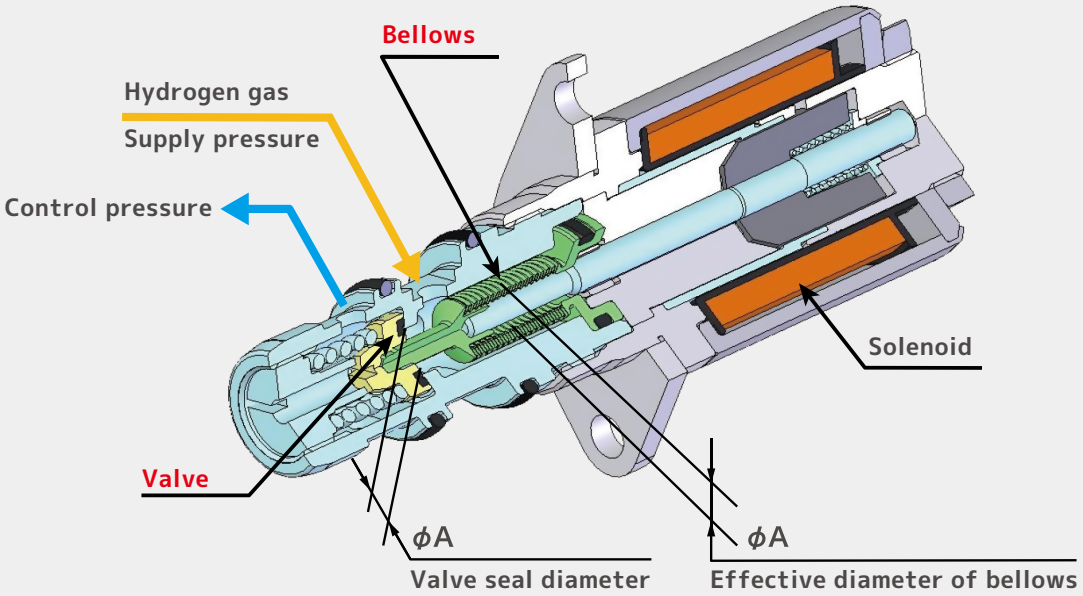
Low leakage & friction

Hydrogen pressure regulator

▶ Contributing to low fuel and power consumption

FCV etc

Low pressure regulator with low leakage, low sliding motion, and excellent contamination resistance



Voltage	12V DC
Current control method	PWM
Current consumption	0～1.8A
Pressure	Supply pressure: 1.6 [MPa] equivalent Control pressure: 0～1.1[MPa]
Flow rate	1,500min (Hydrogen gas) ＊Supply pressure 1.6[MPa], Differential pressure 1.1[MPa]
Leakage	Less than 10 [cc/h] ＊Supply pressure 1.6[MPa]

(Note) The above figures are examples. Please contact us for further information.

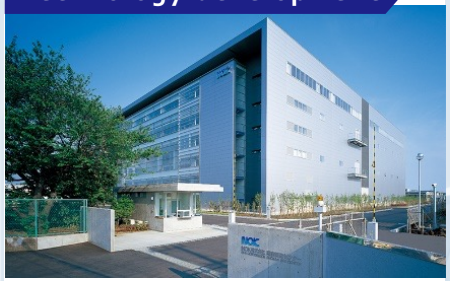
Support

NOK supports your development

Dependable

NOK's products are backed by repeated research on the materials used and mechanical designs. They are highly dependable and have been used for many years in a wide variety of machines.

Technology development



NOK's self-contained development system covers the entire process from product design to product inspection. We actively integrate R&D and production technologies to create unique, cutting-edge technologies and products.

Material technology

Material technology is one of NOK's core technologies. We have been working on the material compounding and chemical analysis technologies needed to develop rubber and adhesives used in seal products.

Global development

NOK has established production bases around the world, including Japan, China, and elsewhere in Asia, and have built a stable supply system to meet our customers' needs.

For consultations and inquiries, feel free to **contact us using this form.**

Links

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