

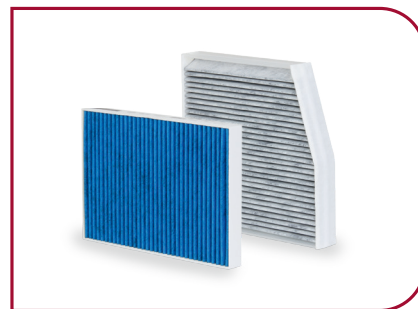
SEALING

VIBRATION
CONTROL

CABIN
AIR FILTER

GERMAN EFFICIENCY. JAPANESE PERFECTION.

COMPONENTS IN OEM QUALITY
FOR ASIAN APPLICATIONS

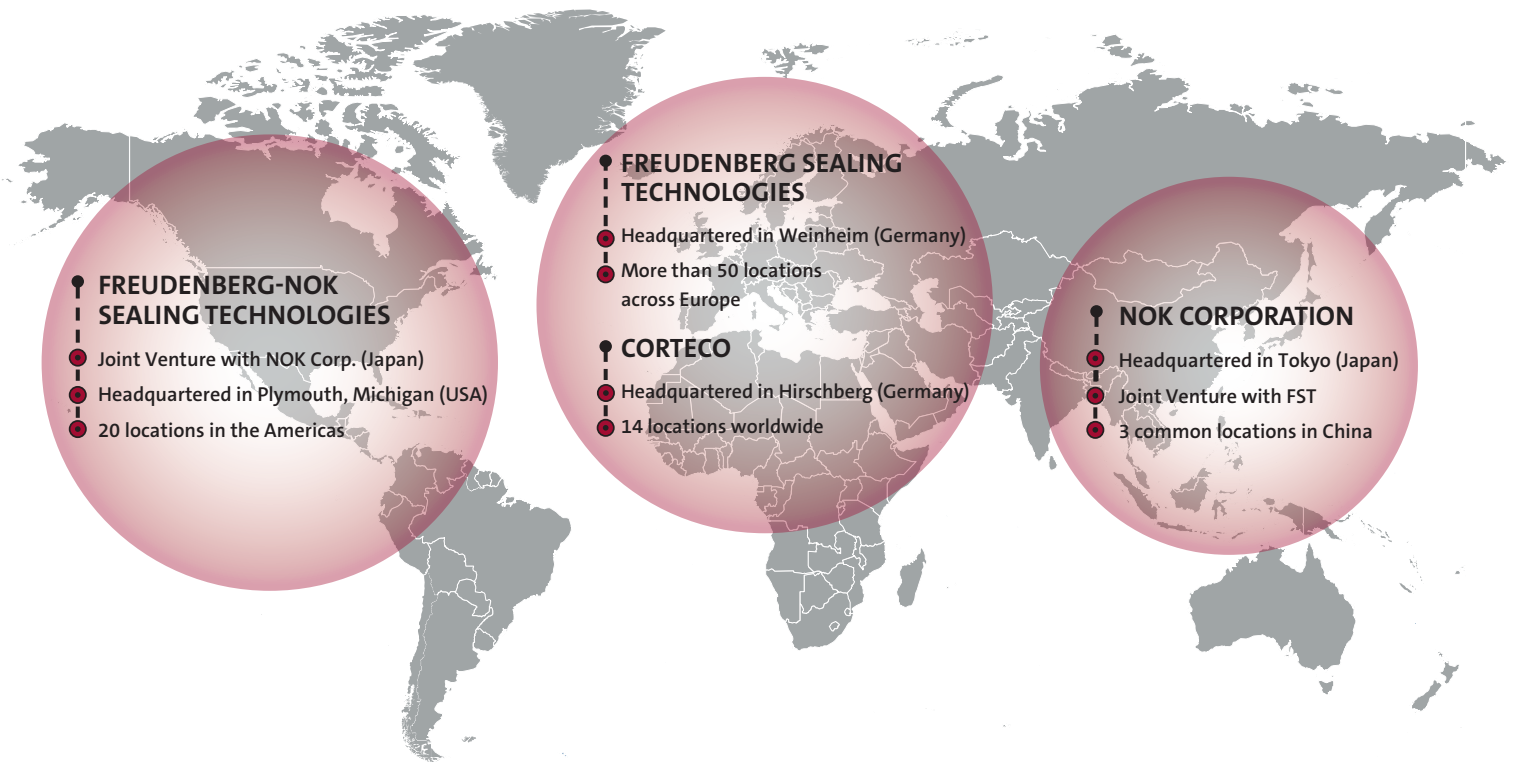


INVESTING IN THE FUTURE

CORTECO AND NOK

Corteco, as an affiliate of the Freudenberg Group, enables the Independent Automotive Aftermarket (IAM) to benefit from OE expertise. Thanks to the strong connection between Freudenberg and NOK, Corteco can supply **automotive spare parts for Asian applications**.

NOK is known as an innovative OE development specialist in Asia due to its **product knowledge and high quality standards**. NOK is the **development partner and leading supplier** for Asian OEMs. Corteco unites the expertise from **cooperations with all major Asian OE manufacturers** and has almost 4,000 sealing products, 2,000 vibration control products and over 250 filters for Asian vehicles in range.



A STORY OF CONTINUOUS IMPROVEMENT IN THE U.S.

Freudenberg and NOK have a long history together, which dates as far back as the 1960s. It was then that Freudenberg first joined forces with NOK to manufacture seals in the U.S. This led to the establishment in 1989 of the Freudenberg NOK general partnership (FNGP). Since then, Freudenberg-NOK has continued to strengthen its partnership and expand its presence in the U.S. Thanks to an eye for quality and continuous improvement of its processes, Freudenberg-NOK Sealing Technologies has positioned itself as the sealing leader in America.



EXPERT IN SEALING TECHNOLOGIES

Corteco is one of the leading suppliers of engine sealing solutions for European and Japanese applications for the IAM. Through the close collaborations with Freudenberg Sealing Technologies (Germany) and Corteco Ishino (Japan), Corteco has the **most comprehensive range** of oil seals and gaskets available to the aftermarket. **Continuous range extension** is secured through product development and **access to future OE technology** via NOK and its joint-venture Pyung Hwa, the preferred development partners for Japanese and Korean OEMs. All Japanese and Korean OEMs are supplied or fully equipped with seals from NOK. By offering the **full spectrum of engine sealing components for Asian applications**, Corteco provides the **convenience of one-stop-shopping**.



COMPOSITE SEALS

Composite seals with integrated flange are used wherever car and truck crankshafts have to be sealed dynamically.

Advantages:

- ▶ Easy and precise mounting to avoid axial misalignment



ESS® ENERGY SAVING SEALS

Combine PTFE design with FKM (Viton) compound, improving performance and leading to a significant friction reduction.

Advantages:

- ▶ Reduction in fuel and oil consumption, as well as CO₂ emissions
- ▶ Improved dynamic sealing efficiency (visco pump principle)



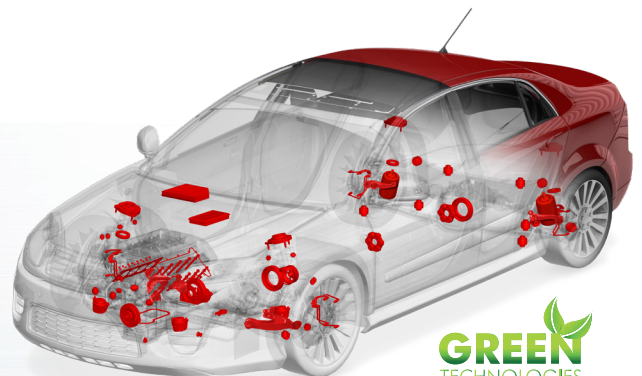
CASCO® CASSETTE SEALS

Seals with ESS technology integrated into a cassette. CASCO seals generate less friction thanks to the advanced “axial” sealing lip design.

Advantages:

- ▶ Greater control of CO₂ - Lower emission levels
- ▶ Longer lasting, despite extreme working conditions

The Corteco logo may be red, but the message is extensively green. Our sealing technologies are designed to reduce fuel consumption and CO₂ emissions, controlling traffic pollution more effectively. Make Corteco the catalyst for your switch to the use of more sustainable and more eco-friendly aftermarket parts.



WHEN DURABILITY MATTERS

Heavy duty vehicles operate in difficult environments. Corteco offers seals that are specially designed to withstand external influences such as large amounts of dust and dirt. **Corteco Cassette Seals**, developed in cooperation with NOK, are the original equipment solutions that fleet operators can rely on. **Corteco Hydraulic Kits** contain all seals required for a complete system replacement within specific vehicle applications. Installers get everything they need for a repair from one reliable source.



VALVE STEM SEALS

Valve stem seal with gas-lip technology to reduce the “blow-by-effect”.

Advantages:

- ▶ Optimization of oil consumption
- ▶ Significant reduction in exhaust gas emissions



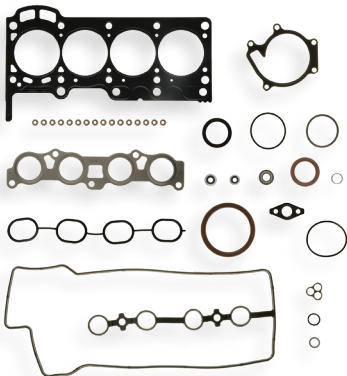
CYLINDER HEAD GASKETS AND HEAD BOLTS

Multi layer steel (MLS) head gaskets are engineered in-house to fit the OE specifications and ensure engine performance and CO₂ reduction.

Head Bolts are the perfect complement to Cylinder Head Gaskets and, when combined, offer the best package for a safe and professional engine repair.

Advantages:

- ▶ Long life durability
- ▶ OE performance
- ▶ Perfect link between Cylinder Head Gaskets and suitable Head Bolts



GASKET KITS

Corteco Ishino Gasket Kit range

- ▶ Full sets that include all components needed for a complete engine repair
- ▶ Head sets dedicated to Cylinder Head repair

Advantages:

- ▶ Composition based on direct customer/ work-shop feedback
- ▶ OE performance
- ▶ Complementarity with Cylinder Head Gaskets and Head Bolts

Corteco's static sealing range is completed by Silicone Paste, Oil Drain Plugs and Injector Washers.

EXPERT IN VIBRATION CONTROL



High performance rubber to metal components to isolate vibrations are manufactured through the **support of technical capabilities and rich experience** of Vibracoustic, the **global market leader** in the field of automotive vibration control technology and the rubber processing and adhesive technologies of NOK. NOK Vibracoustic and its Korean joint venture Pyung Hwa Industry are companies belonging to the Freudenberg and NOK Group, providing **vibration control products for the Asian OEM** in Japan and Korea. They provide access to the **largest range of OE parts and latest technology**.



CRANKSHAFT PULLEYS

Crankshaft pulleys control the vibrations within the crankshaft. If they are not controlled in the right way the crankshaft might break at certain operating speeds.

- ▶ Damper pulleys
- ▶ Decoupled damper pulleys
- ▶ Overrunning damper isolator pulleys
- ▶ Damper pulley and bolt kits



ENGINE AND GEARBOX MOUNTS

Each rubber mixture has special damping properties and needs to be matched precisely to the design of the specific application. Corteco offers original quality with the highest performance, fitting accuracy and safety.

- ▶ Conventional engine mounts
- ▶ Hydro mounts
- ▶ Switchable engine mounts
- ▶ Lightweight mounts



SUSPENSION STRUT MOUNTS

Suspension strut mounts isolate the dynamic forces of the suspension strut and the spring thus avoiding the transfer of vibration to the vehicle body.

- ▶ Strut mounts including ball bearings



CHASSIS AND DRIVE TRAIN MOUNTS

Components such as chassis mounts and bushings play a decisive role when it comes to driving safety and comfort.

- ▶ Stabilizer mounts
- ▶ Drive train mounts
- ▶ Chassis and axle mounts
- ▶ Hydraulic accumulators

A COMPLETE RANGE OF STEERING AND SUSPENSION COMPONENTS

Combined skills and the expertise of leading original equipment manufacturers enable a unique range of vibration control parts - including pulleys, flexible propshaft couplings, suspension strut mounts, engine and gearbox mounts and hydraulic accumulators. Corteco reinforces its vibration control offer of powertrain and chassis components with a large number of Steering & Suspension articles for Asian applications.



TRACK CONTROL ARMS

Track control arms connect the vehicle chassis and the suspension module that carries the wheel.

Advantages:

- ▶ Ensure quick and precise movement of the wheels
- ▶ Ensure comfort due to vibration damping
- ▶ Lightweight mounts



STABILIZER LINKS

The stabilizer link controls the body roll of the vehicle during turns by connecting the anti-roll bar and the suspension system of the vehicle.

Advantages:

- ▶ Minimizes noise transmissions
- ▶ Enables safe and comfortable driving



TIE ROD ENDS / TIE RODS

Fixed and adjustable tie rods are the connection between the steering box and the steering wheels of the vehicle.

Advantages:

- ▶ Adjustable to the needs of each individual chassis
- ▶ Ensure accurate steering and safe drivability
- ▶ Reduction of vibration of the steering wheel
- ▶ Reduction in tire wear

BALL JOINTS

The ball joint is an indispensable component used in tie rods, control arms and stabilizer links.

NOK is also a supplier of dust covers for major OEMs.





EXPERT IN CABIN AIR FILTER

Every one in two new cars is fitted with Freudenberg original filters. Corteco offers one of the **broadest ranges of cabin air filters for Asian applications** to its Automotive Aftermarket customers. Each filter is available as a particle and a carbon activated version. The range is completed by the innovative Blue Filter, which is highly efficient in **protecting the air conditioning system and passengers** from external pollutants.



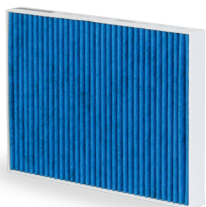
PARTICLE FILTERS

- ▶ Filter out fine dust, soot, exhaust emissions, pollen, bacteria and respirable particles
- ▶ Protect against irritation and health risks
- ▶ Prevent poor visibility caused by fogged-up windows
- ▶ Extend the service life of the entire air conditioning and ventilation system



COMBI FILTERS

- ▶ Have all the filtering capabilities of particle filters
- ▶ Provide additional protection against exhaust fumes, unpleasant odors, ozone, benzene and other hazardous gases
- ▶ Combi-filters serve a dual function: health risks are minimized while driving comfort is maximized



BLUE FILTERS

- ▶ Provide the best possible protection against particulate matter, allergens and gaseous pollutants inside vehicles
- ▶ The bio functional layer additionally traps and inactivates the captured viral aerosols and prevents re-aerosolization
- ▶ Significantly reduce the concentration of airborne viral aerosols inside the car

GERMAN - JAPANESE PARTNERSHIP



- ▶ 1929: Invention of the modern oil seal, creating the beginnings of the dynamic sealing industry worldwide.
- ▶ 1960: Beginning of the international collaboration between the NOK Corporation and Freudenberg.
- ▶ Today: Freudenberg products are available in over 160 countries. The Freudenberg Group is a leading supplier of the automotive industry (OEM) for sealing, vibration control and cabin filtration.



- ▶ 1939: Establishment of Oil Seals Japan in Kobe. NOK is the oldest oil seal maker of Japan.
- ▶ 1960: Beginning of the international collaboration between the NOK Corporation and Freudenberg.
- ▶ Today: Major Asian car manufacturers are dealing with NOK for their OE equipment in Oil Seals and Vibration Control parts.

