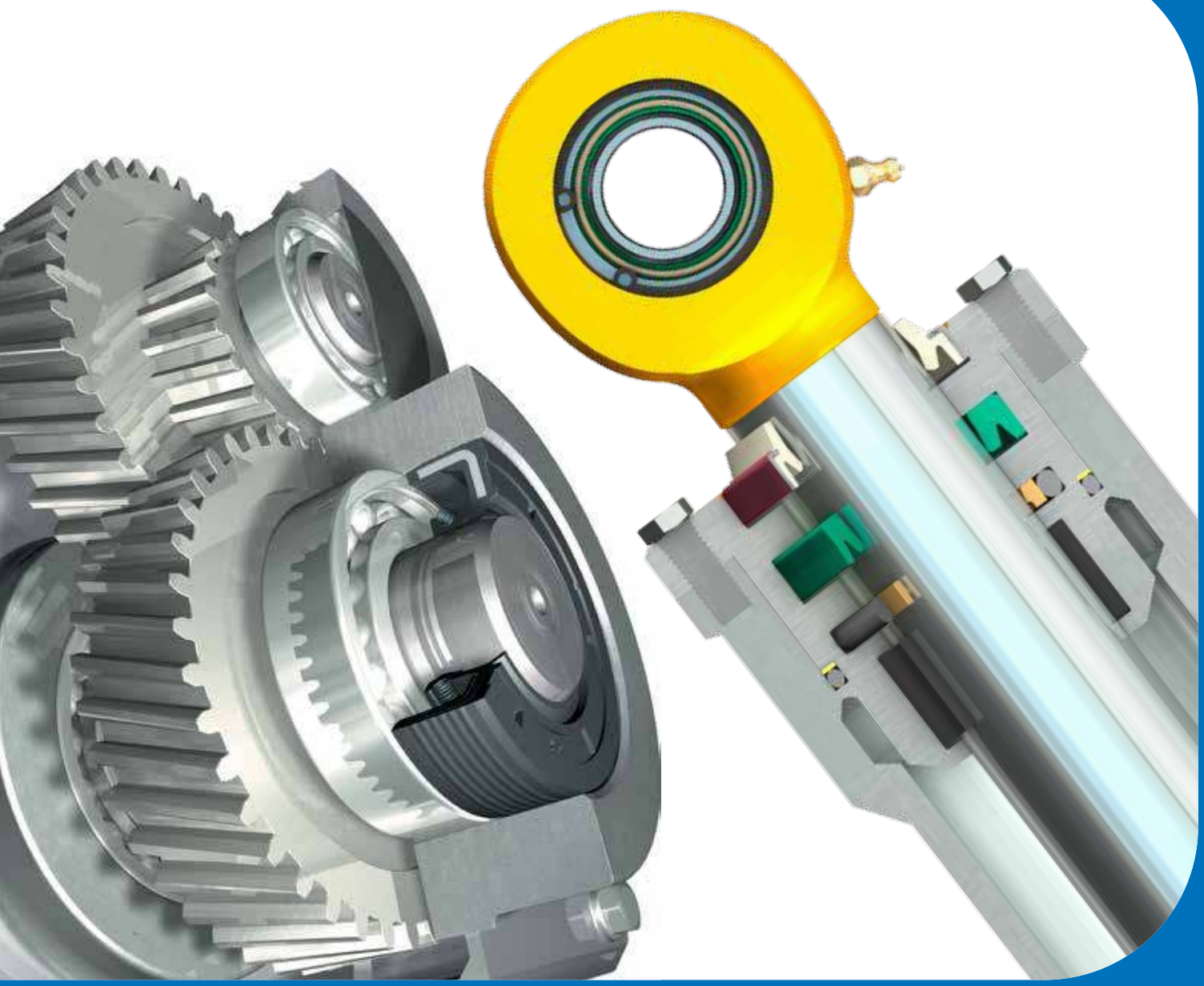
Industrial sealing solutions

Optimizing your applications



The Power of Knowledge Engineering


SKF

See your sealing challenges from a new perspective

While seals have a crucial impact on system performance, in many applications they are viewed as a maintenance component, or even a commodity item. Not at SKF. Backed by more than 100 years of industrial application experience, SKF sees every sealing challenge as an opportunity to boost performance. Our customers benefit from our unmatched understanding of both the interaction between bearings, seals and lubrication, as well as the dynamics of reciprocating systems. This deep knowledge base supports every sealing solution we offer, for equipment ranging from power transmission to fluid power and fluid handling systems.

A single source for industrial seals

We offer industrial equipment OEMs and end-users a comprehensive selection of sealing options, whether you need a replacement seal, or a highly engineered solution for an extremely demanding application. With both moulded and machined seal manufacturing capabilities available worldwide, we deliver seals in quantities ranging from a few prototypes to serial production.

Although SKF is well known for providing high-quality bearings to diverse industries through our global logistics system, we use that same system to supply an extensive range of seals for rotating, reciprocating and static applications.

Engineered for your requirements

Temperatures, speeds, pressures, lubricants and other application operating conditions greatly impact seal life and performance. Accordingly, the knowledge that goes into the development of a sealing solution makes the difference between poor, adequate, or exceptional performance.

With our proven capabilities in seal design, materials, testing and manufacturing, SKF offers extensive support to help engineering teams worldwide make all the right choices during the entire product life cycle. We can also help you evaluate seals on-site at your location, or at one of our global testing facilities using both physical test rigs as well as 3D modelling and simulation tools.

Such capabilities have allowed SKF to develop seals that are optimizing performance in everything from the world's fastest race cars to the most efficient wind farms. Whether you need an all-new seal or to upgrade an existing one, industrial sealing solutions from SKF can help you optimize your system too.

Materials

Industrial seals are exposed to a wide range of challenging operating conditions such as high temperature, speed, pressure and agressive chemicals. To handle these and other harsh conditions, it is essential to select the most suitable sealing materials. Several factors impact material selection, including exposure to media, pressure, temperature and stringent regulatory requirements common in food and beverage or oil and gas applications.

Whatever your requirements are, SKF can meet them with a wide range of rubbers, thermoplastic elastomers and other materials such as high performance plastics. SKF constantly develops solutions for high performance applications from these key material types:

Rubbers

These materials are extremely flexible and can be stretched and deflected by exerting relatively little force. Many of them deliver excellent resistance to mineral oils, greases, or other media.

Thermoplastic elastomers

Thermoplastic elastomers offer advantages typical of both rubber and plastic materials. SKF's high performance polyurethanes (TPU) combine excellent abrasion and wear resistance, low compression set and tear strength, and outstanding pressure resistance.

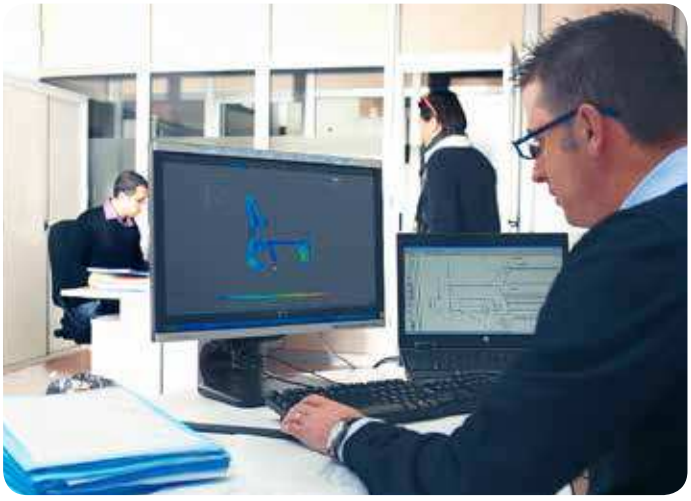
PTFE

Engineered to handle extreme conditions, polytetrafluoroethylene (PTFE) and its compounds can withstand aggressive chemicals plus high temperatures and pressures. Due to their extremely low coefficents of friction, they can also tolerate dry running conditions.

Plastics

From engineering plastics to high performance plastics such as PEEK, SKF's range of specialty plastic materials can meet higher temperature, chemical and mechanical property requirements.

Design



As the world's only engineering company that develops both bearings and seals, SKF has a unique perspective on the interplay of elements in rotary sealing systems. And during our 100+ years of diverse industrial application experience, we've also developed a deep understanding of the conditions that affect reciprocating and static seals. Sealing solutions from SKF benefit from years of research and development in sealing technology combining materials, design and tribology.

Our in-house simulation tool, SKF Simulator for seals, can be used to explore the non-linear behaviour of various sealing materials, which helps to predict sealing performance under various conditions.

SKF engineers also apply non-linear Finite Elements Analysis (FEA) to simulate almost any operating condition by using different seal geometries to identify the critical areas in the design.

Testing

Developing optimized sealing solutions requires sophisticated testing and analytical methodology, thus SKF operates a global network of dedicated testing facilities. Every year, these state-of-the-art laboratories conduct thousands of tests, including durability, performance, contaminant exclusion, salt fog corrosion, cold fracture, pump rate, friction torque, dry wear, and chemical compatibility.

We can test seals in static and pulsating test rigs capable of simulating harsh operating conditions, including extreme pressures and temperatures. Dynamic tests are continuously monitored to verify parameters such as under-lip temperature, friction force and friction torque, oil leakage, extrusion resistance and a host of other conditions.

Results from thousands of seal tests conducted annually provide valuable know-how and a broad empirical knowledge base for failure analyses and benchmarks, ultimately leading to a consistent flow of new products and innovative solutions.

Manufacturing flexibility

Whether you need a single seal or a high-volume production run, SKF can support your needs. Our flexible seal production model combines moulded and machined manufacturing capabilities to accommodate virtually any demand.

With competencies in compression, injection and transfer moulding technologies, SKF can apply the most appropriate option for your requirements. With the machined seals concept, we are also able to provide machined seals very quickly, without tooling costs.

Radial shaft seals

SKF offers an array of proven shaft sealing solutions that protect bearings, keep lubricants in and improve system reliability. At work in power transmissions across every major industry, SKF radial shaft seals support greater uptime in everything from the smallest high-speed machine tools to the largest wind turbines.

Seals for general industrial applications

Available in diverse designs and materials, SKF general industrial seals include many that meet ISO, ASTM, or DIN standards. SKF rubber outside diameter shaft seals resist aggressive gearbox oils. SKF metal outside diameter shaft seals feature the SKF Wave lip design, which reduces friction compared to conventional straight edge radial lip seals.

Seals for heavy industrial applications

In heavy industries, keeping lubricants in and contaminants out of systems is a serious challenge. SKF can meet it with heavy-duty metal-cased seals, rubber outside diameter seals with metal inserts or rubber reinforcement, and polyurethane seals. Reinforced all-rubber HSS seals feature a harder grade material for the part of the seal body that contacts the housing bore, improving stability during operation and installation.

Cassette seals

Featuring a multi-lip seal, an integrated wear sleeve and high-performance elastomeric materials, SKF Mudblock seals for oil or grease applications deliver robust protection from harsh contaminants.

Axial shaft seals

Designed to seal axially against a counterface perpendicular to the shaft or pin, axial shaft seals from SKF include high performance primary seals plus cost-effective secondary seals such as V-ring seals.

Track pin seals

Representing a new generation of heavy-duty sealing units for oil-lubricated track chain pins, SKF Trackstar seals can help dozer operators reduce machine wear, maintenance and operating costs.

Metal face seals

Originally designed for low speeds and severe conditions that affect off-road and tracked vehicles, SKF metal face seals have proven equally suitable for applications exposed to sand, soil, mud, water and more.

V-ring seals

V-ring seals from SKF offer an easy-to-install solution for rotating shaft applications, including use as a secondary seal in highly contaminated environments. They can be stretched and, depending on the size, pushed over other components like flanges, pulleys or even housings.

Axial excluder seals

Featuring our proprietary special H-ECOPUR material, SKF axial excluder seal HRC1 offers a high-performance alternative to rubber excluder seals that can wear out quickly when operating on abrasive counterfaces or under poorly lubricated conditions.

Wear sleeves

Over time, contaminants, high pressure and speed, or inadequate lubrication can cause particles to become trapped underneath a shaft sealing lip. Wear grooves begin to form on the shaft as it rotates, eventually leading to sealing failure and severe shaft damage. Repairs usually involve dismantling and re-machining the shaft, and installing a new seal size. SKF Speedi-Sleeve and large diameter wear sleeves offer a much faster, more cost-effective alternative.

SKF Speedi-Sleeve – Standard and Gold

SKF Speedi-Sleeve is a thin-walled shaft sleeve that is simply pressed into position over the shaft to provide an excellent sealing surface for radial shaft seals. In fact, its surface properties result in a counterface that is better than what can normally be achieved on a shaft.

Whether it is used to reduce initial shaft machining expenses or to limit downtime costs while repairing a worn shaft, SKF Speedi-Sleeve offers enhanced sealing system performance and benefits for both OEM and aftermarket customers – without the need to change the original seal size.

Large diameter sleeves

Designed for heavy industrial applications, large diameter wear sleeves accommodate shaft dimensions up to 1 143 mm (*45 in.*).




Hydraulic seals

For fluid power applications like hydraulic cylinders, seals have to withstand extreme operating conditions and high power density demands. SKF can meet these requirements with highly engineered designs and proprietary material formulations that provide outstanding mechanical properties and excellent chemical compatibility with various hydraulic fluids.

Piston seals

Optimized for single and double-acting cylinders, piston seals prevent flow past the piston while allowing an oil film to minimize friction and wear. The SKF piston seal profiles CUT and SCP combine polyamide/nitrile materials and a step-shaped split for easy installation and effective sealing for high pressure applications. MPV and DPV polyurethane piston seals feature optimized dynamic surface profiles and side vent notches in our proprietary X-ECOPUR PS material, which was developed specifically for piston seals.

Rod and buffer seals

SKF has a robust range of rod and buffer seals to prevent failures and boost system reliability. Designed for heavy-duty metric applications, single-lip S1S rod seals are made of our proprietary ECOPUR thermoplastic polyurethane.

Designed to protect the rod seal from system pressure spikes, SKF buffer seals support rod seal functionality and longer hydraulic cylinder service life. RBB buffer seals are a U-cup design suitable for heavy-duty applications.

Fluid handling seals

For fluid handling applications like those in the oil and gas or food and beverage industries, seals come into direct contact with aggressive fluids or slurries. SKF offers sealing solutions that can withstand these harsh conditions, as well as meet the stringent regulatory requirements of such industries.

Wiper seals

SKF wiper seals prevent contaminants from being transported into the system with the reciprocating piston rod. Our single-acting press-in PA profiles are widely used in off-highway equipment. For snap-in applications, our patented DX wiper seal features the functional benefits of a press-in seal, but with snap-in convenience and better rod tracking.

Guide rings

Non-metalic SKF guide rings prevent wear and damage to the cylinder bore and piston rod sealing surfaces. Our polymeric material guides are precision-machined and available in reinforced polyamide, phenolic resin and fabric or PTFE, and deliver substantial improvements in seal life and sealing performance. For heavy duty applications, SKF guide rings include the PGR piston guide ring, the RGR rod guide ring, or the WAT which can be used in either rod or piston applications.

O-rings and back-up rings

Genius in their simplicity, O-rings seal through their own deformation between surfaces. In hydraulic systems, O-rings from SKF are often used as static sealing elements. Using one or two SKF back-up rings with an O-ring can help prevent O-ring extrusions from getting into the clearance gaps.

Rock hammer seals

Hydraulic rock hammers require hydraulic reciprocating seals that can handle short strokes and extremely high velocities. These seals are made of high-performance polyurethane and bonded to a low-friction PTFE back-up ring for longer service life and less maintenance.

SKF Spectraseal

The SKF Spectraseal product line is used when conventional elastomer or thermoplastic seals cannot withstand temperature extremes, aggressive chemicals and solvents, abrasive or non-lubricating media, high surface speeds and/or high pressures.

SKF Spectraseal are seals machined from engineered plastic materials such as PTFE-based compounds, ultra high molecular weight polyethylene (UHMWPE), polyetheretherketone (PEEK) and other high performance plastics. They are also available in materials with a very low coefficient of friction, enabling sealing at high surface speeds in dry or non-lubricating conditions while reducing linear or rotating friction.

Rotary manifold seals

SKF rotary manifold sealing solutions maintain proper fluid flow between machine components for virtually any application, including those optimized for low friction to enable greater energy efficiency and service life.

Locking T-seals

Locking T-seals from SKF enable easier assembly and less risk of damage, even in remote locations or with automated equipment. The seals feature ridges that snap into place when installed and mechanically lock the anti-extrusion rings in the proper orientation. The seals can also be used in dynamic reciprocating applications, as well as high-pressure static connections.



Machined seals concept

Meeting unique sealing demands, on-demand

The machined seals concept provides a fast, flexible alternative to moulded seal production. With a unique combination of capabilities, we can deliver polymer seals in a very short time, in virtually any dimension and any design, for virtually any industrial application.

The machined seals concept combines several SKF strengths, including extensive application engineering support, a wide selection of seal profiles and materials, and worldwide availability. Together, these capabilities enable on-demand manufacturing for everything from a single seal to a low-volume series, for fluid power, fluid handling and power transmission applications.

Application engineering support

We begin with a consultative process through which our engineers gain an understanding of your particular sealing application challenges. Once we determine your unique requirements, we can develop a solution, choosing from the most appropriate seal profiles and materials.

Profile and materials selection

We select your seal profiles from an array of designs that are pre-programmed in our proprietary machining system, or we can work with you to design a fully customized profile. Our engineers will also determine the optimum sealing material.

Our world-class range of standard and special-grade machinable sealing materials includes many that comply with FDA, NSF, NORSOK, NACE and other key industry standards and government regulations.

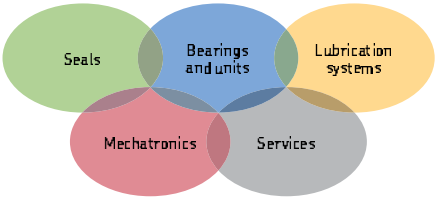
CNC manufacturing process

Featuring proprietary software and high-precision cutting tools, the SKF SEAL JET manufacturing system uses Computer Numerical Control (CNC) technology to machine polymer seals quickly. The system machines a seal from a semi-finished tube of your specially selected materials.

Rapid delivery worldwide

The machined seals concept and related services are available globally at selected SKF Solution Factories and machined seals centres. Strategically positioned throughout the world's major industrial markets, these facilities enable rapid manufacturing and delivery.

Need a unique sealing solution to solve an application problem or to meet an immediate need? SKF can deliver it – quickly and cost-effectively.



The Power of Knowledge Engineering
Combining products, people, and application-specific knowledge, SKF delivers innovative solutions to equipment manufacturers and production facilities in every major industry worldwide. Having expertise in multiple competence areas supports SKF Life Cycle Management, a proven approach to improving equipment reliability, optimizing operational and energy efficiency and reducing total cost of ownership.

These competence areas include bearings and units, seals, lubrication systems, mechatronics, and a wide range of services, from 3-D computer modelling to cloud-based condition monitoring and asset management services.

SKF's global footprint provides SKF customers with uniform quality standards and worldwide product availability. Our local presence provides direct access to the experience, knowledge and ingenuity of SKF people.

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