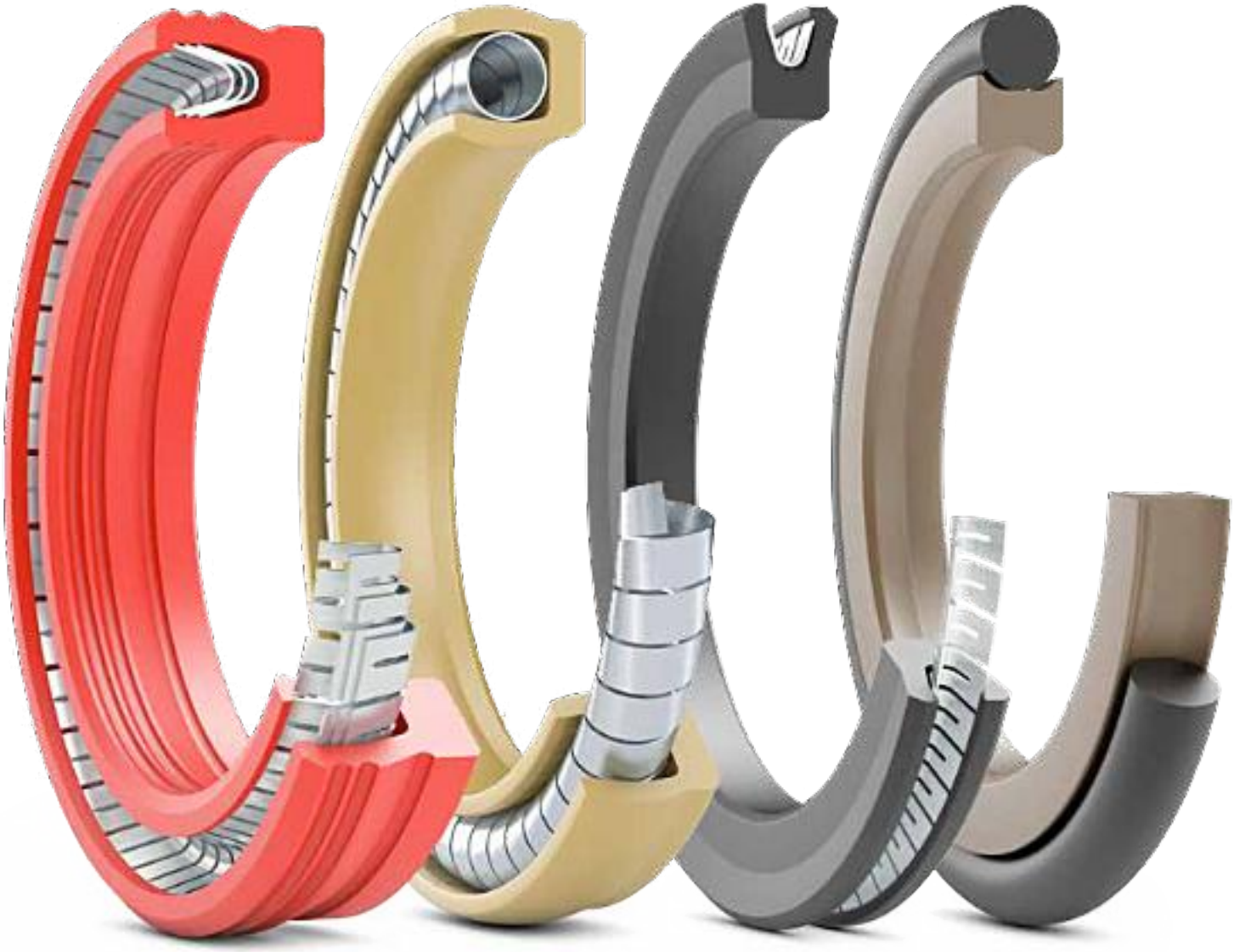
SKF Spectraseal

Sealing solutions for extreme application challenges



The Power of Knowledge Engineering

Handling challenges that conventional seals can't

Need unconventional sealing performance?

When extreme operating conditions or unique application demands prove to be more than your catalog sealing solution can handle, SKF Spectraseal products can help. The SKF Spectraseal line features seals machined from high-performance engineered plastic materials. SKF Spectraseal solutions deliver reliable, long-lasting seal performance in conditions that would cause conventional elastomer or thermoplastic seals to fail.

Customize and optimize with SKF Spectraseal

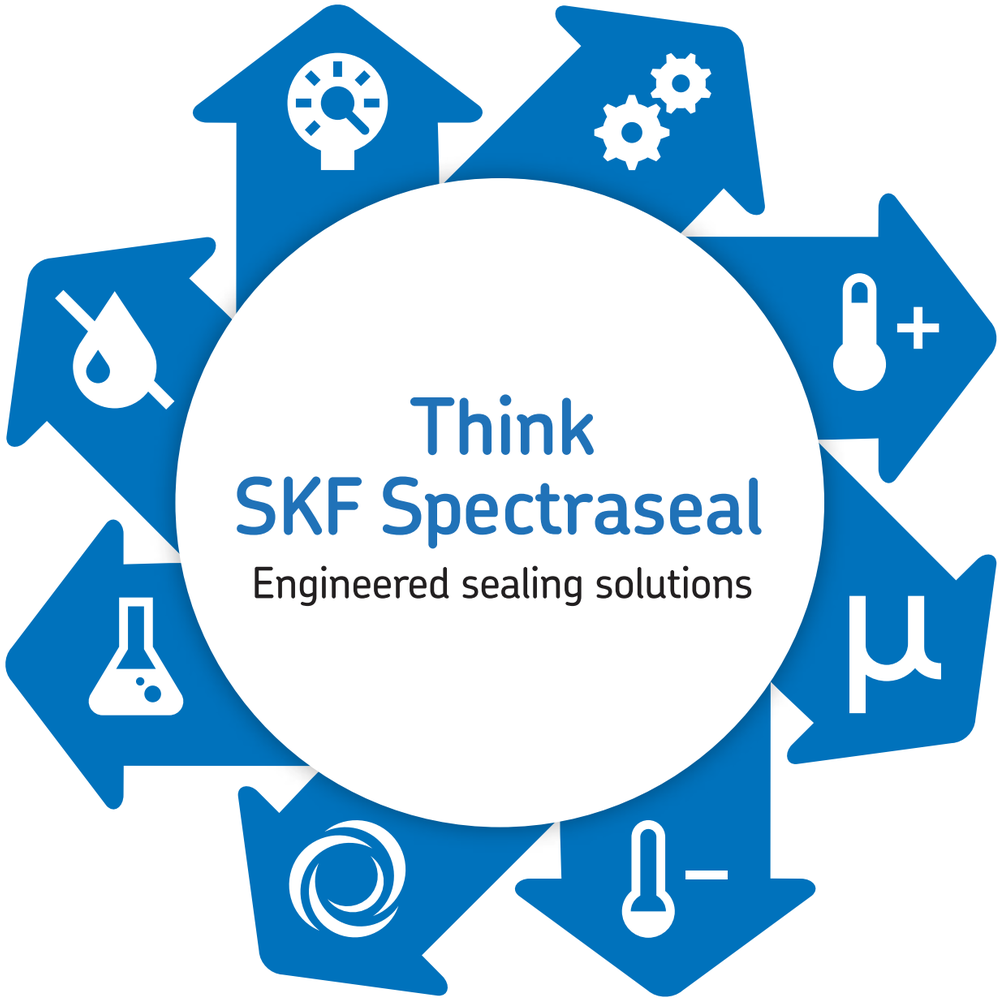
Every extreme sealing challenge is unique, and so is every SKF Spectraseal solution. SKF engineers will work with your team step-by-step, from materials and profile design and selection to seal testing in the application. During seal prototype trials, SKF engineers can offer suggestions to optimize both seal and hardware design.

Whether you need an alternative to a seal failing or underperforming in operation, or need to address a difficult sealing challenge for a new application, SKF Spectraseal solutions can help you conquer seemingly impossible sealing challenges.

A multi-material difference

SKF Spectraseal solutions are machined from many engineered plastic material combinations – more than 100 compounds from key high-performance groups:

- PTFE and PTFE-based compounds
- UHMWPE
- PEEK
- PPS
- Polyamide
- POM



Extreme pressure

With elastomer seals, differential pressure across contact surfaces can cause seal distortions, deformations, or extrusions that lead to permanent performance loss.

Reduce wear

Seal wear is the loss of seal materials at the dynamic contact surface. Special designs and engineering plastics can improve wear life, especially in non-lubricated or abrasive media conditions.

High temperature

Excessive heat generated by an ambient source, sealed media or seal friction can exceed temperature specifications of elastomer seals.

Low friction

SKF Spectraseal solutions incorporate materials with low coefficient of friction combined with light load springs and optimized seal geometries to meet very low friction force requirements.

Low temperature

Extreme cold caused by ambient conditions, sealed media or sudden pressure drop can exceed temperature specifications of elastomer sealing materials.

High velocity

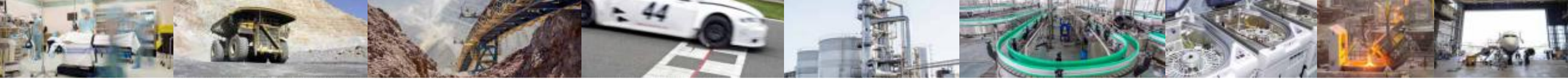
If sliding between the seal contact surface and the sealed counter surface occurs at a high enough differential speed, heat and abrasion can damage elastomer seals.

Chemical resistance

Conventional sealing materials generally cannot withstand aggressive acids, bases, or solvents.

Insufficient lubrication

During dry-running or poor-lubrication conditions, sliding between the seal contact surface and the counter surface can generate enough friction to damage elastomer seals.



Examples of SKF Spectraseal solutions at work worldwide

Oil and gas

High-pressure seals for chemical injection pumps deliver reliable sealing performance up to 1 380 bar (*20 015 psi*).

Spring-energized seals for ball and plug valves provide reliable sealing performance in temperatures as low as –250 °C (*–418 °F*).

Spring-energized seals for gate valves are in use in stem and seat areas. Stem seals designs from SKF have passed API 6A PR2 test requirements at 1 378 bar (*20 000 psi*).

Spring-energized seals for static joints in turbo compressors seal aggressive gasses at high pressures and in temperatures above 260 °C (*500 °F*).

General industrial

Seals for paint, resin and adhesive pumping and spraying provide industry-leading performance, including reciprocating sealing of non-lubricating media at 207 bar (*3 000 psi*).

Piston and rod seals offer proven performance in consumer and contractor nail guns, in which low friction and the need for high-speed dynamic sealing of dry air rule out typical elastomer seals.

PTFE shaft seals are used in high-speed blowers sealing non-lubricating media at rotating speeds greater than 20 m/s (*21.8 yd/s*).

IM seals have replaced conventional manifold seals used in logging equipment due to lower torque, better sealing – at 207 bar (*3 000 psi*), and longer seal life.

Medical and healthcare

Spring-energized seals are used in wearable insulin pumps, which require a tight seal to keep contaminants from entering the pump, as well as a low-friction solution to accommodate the small motors that drive these units.

Low-friction spring energized seals provide proven sealing performance in high-speed rotary surgical tools, which operate at 20K RPM and up. SKF Spectraseal solutions protect bearings from contamination and provide a tight seal in autoclave conditions.

Wobble piston compressor seals used in oxygen concentrators feature SKF-optimized materials that deliver longer service life in this high-speed, non-lubricated application.

Food and beverage

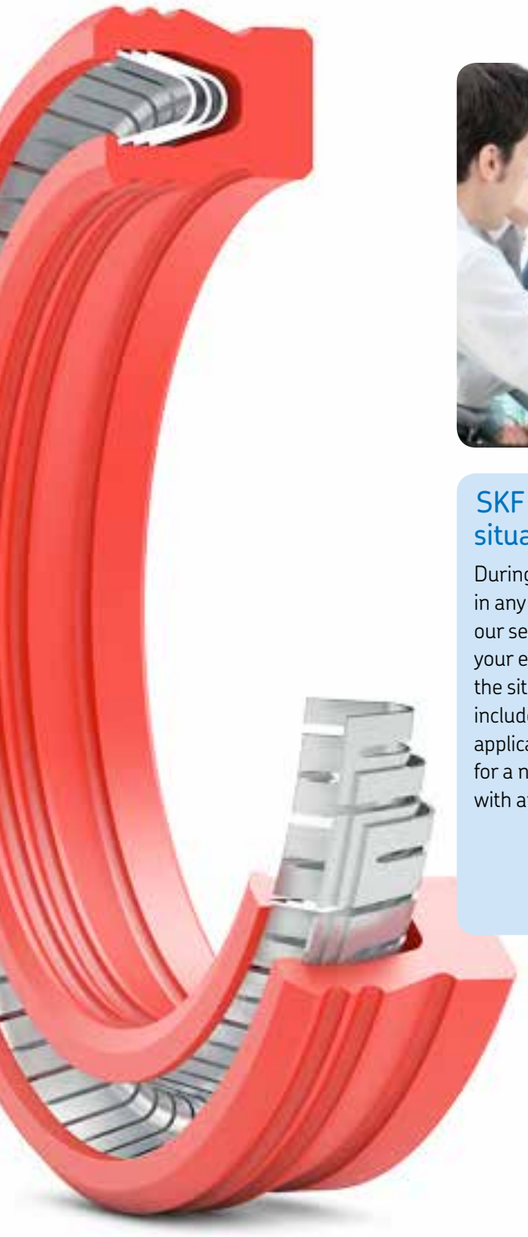
Spring-energized sealing materials are FDA-compliant and used as linear piston seals in food filling equipment.

A rod packing assembly featuring FDA-compliant materials is sealing homogenizers at 700 bar (*10 156 psi*) in temperatures up to 110 °C (*230 °F*).

SKF Spectraseal solutions and bushings are used for rotating applications in vessel cleaning equipment, sealing aggressive cleaning media at low friction.

Your path to sealing success:

The SKF Spectraseal solution workflow



SKF assesses the situation

During this mandatory first step in any SKF Spectraseal project, our seal engineers consult with your engineering team and assess the situation. Typical challenges include seals needed for a new application, or replacement seals for a new or recurring problem with an existing seal.

SKF proposes a seal

Drawing on a wide range of sealing materials, designs and experience, SKF engineers generate an initial seal design for your review – depending on the complexity of the challenge, seal designs are available within a few days or less.

Rapid prototyping begins

SKF uses Computer Numerical Control (CNC) technology to machine seal solutions quickly. In many cases prototypes can be produced in two weeks or less, without the need for tooling or additional setup fees.

Customer tests seal in application

Because every application challenge is unique, prototype seals should be evaluated in the customer's actual device. SKF engineers will examine the tested seals and possibly mating hardware to determine if the seal is performing as intended.

Seal production

Once all seal requirements are met and seal production begins, SKF seal engineers continue to support implementation and continuous improvement as may be required by changes in applications.

Concept review and collaboration

Seal optimization

SKF engineers apply insights uncovered during seal testing to improve the SKF Spectraseal solution.

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.

The SKF BeyondZero portfolio offers products and services with enhanced environmental performance characteristics.

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.

Every SKF Spectraseal solution/application is unique; solutions referenced in this brochure are not continuous or simultaneous.

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