

Machined seals

Product range



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SKF – the knowledge engineering company

From one simple but inspired solution to a misalignment problem in a textile mill in Sweden, and fifteen employees in 1907, SKF has grown to become a global industrial knowledge leader.



Over the years, we have built on our expertise in bearings, extending it to seals, mechatronics, services and lubrication systems. Our knowledge network includes 46,000 employees, 15,000 distributor partners, offices in more than 130 countries, and a growing number of SKF Solution Factory sites around the world.

Research and development

We have hands-on experience in over forty industries based on our employees' knowledge of real life conditions. In addition, our world-leading experts and university partners pioneer advanced theoretical research and development in areas including tribology, condition monitoring, asset management and bearing life theory. Our ongoing commitment to research and development helps us keep our customers at the forefront of their industries.

Meeting the toughest challenges

Our network of knowledge and experience, along with our understanding of how our core technologies can be combined, helps us create innovative solutions that meet the toughest of challenges. We work closely with our customers throughout the asset life cycle, helping them to profitably and responsibly grow their businesses.

Working for a sustainable future

Since 2005, SKF has worked to reduce the negative environmental impact from our operations and those of our suppliers. Our continuing technology development resulted in the introduction of the SKF BeyondZero portfolio of products and services which improve efficiency and reduce energy losses, as well as enable new technologies harnessing wind, solar and ocean power. This combined approach helps reduce the environmental impact both in our operations and our customers' operations.

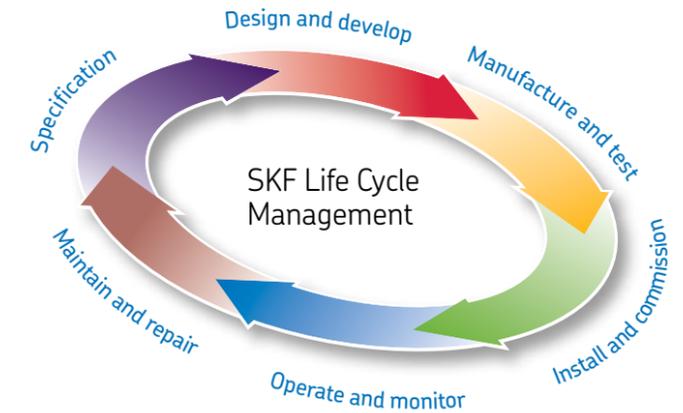
SKF Solution Factory makes SKF knowledge and manufacturing expertise available locally to provide unique solutions and services to our customers.

Working with SKF IT and logistics systems and application experts, SKF Authorized Distributors deliver a valuable mix of product and application knowledge to customers worldwide.



Our knowledge – your success

SKF Life Cycle Management is how we combine our technology platforms and advanced services, and apply them at each stage of the asset life cycle, to help our customers to be more successful, sustainable and profitable.



Working closely with you

Our objective is to help our customers improve productivity, minimize maintenance, achieve higher energy and resource efficiency, and optimize designs for long service life and reliability.



Innovative solutions

Whether the application is linear or rotary or a combination, SKF engineers can work with you at each stage of the asset life cycle to improve machine performance by looking at the entire application. This approach doesn't just focus on individual components like bearings or seals. It looks at the whole application to see how each component interacts with each other.



Design optimization and verification

SKF can work with you to optimize current or new designs with proprietary 3-D modelling software that can also be used as a virtual test rig to confirm the integrity of the design.



Bearings

SKF is the world leader in the design, development and manufacture of high performance rolling bearings, plain bearings, bearing units and housings.

Machinery maintenance

Condition monitoring technologies and maintenance services from SKF can help minimize unplanned downtime, improve operational efficiency and reduce maintenance costs.

Sealing solutions

SKF offers standard seals and custom engineered sealing solutions to increase uptime, improve machine reliability, reduce friction and power losses, and extend lubricant life.

Mechatronics

SKF fly-by-wire systems for aircraft and drive-by-wire systems for off-road, agricultural and forklift applications replace heavy, grease or oil consuming mechanical and hydraulic systems.

Lubrication solutions

From specialized lubricants to state-of-the-art lubrication systems and lubrication management services, lubrication solutions from SKF can help to reduce lubrication related downtime and lubricant consumption.



Actuation and motion control

With a wide assortment of products – from actuators and ball screws to profile rail guides – SKF can work with you to solve your most pressing linear system challenges.



Machined seals concept

Meeting unique sealing demands, on-demand

The machined seals concept provides a fast, flexible alternative to molded 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 our 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.

Promptly manufactured seals up to 157.5 inches in diameter as one piece and even larger using a special welding technique.



Sealing materials

Introduction

Increased requirements for sealing technology reinforces the importance of selecting the appropriate sealing materials. Sealing materials face demands for higher speeds, temperatures and pressures, and are often confronted with poor lubricating fluids. Fluids like HFA and HFB as well as biologically degradable hydraulic fluids (vegetable oils and synthetic esters) present many challenges for developers of sealing materials.

In the sealing technology, different groups of macromolecular (polymer) substances are used. Macromolecular substances are organic compounds whose molecules consist of several thousands, often even millions of atoms, known as macro, giant, string or chain molecules. They can be created either by modification of highly molecular natural materials (e.g. natural rubber) or by depositing low-molecular elements (so called monomers) through various chemical reactions (synthetic materials, plastics).

SKF acknowledged this with the transfer of R&D from a standard solution provider to becoming a developer of special, tailor-made solutions. Projects with close client

co-operation succeed best in achieving the optimal sealing solution.

In this brochure, we feature 25 standard materials. All of these materials have been developed by SKF to meet standard customer requirements. Additionally, we supply special materials to meet specific application demands.

Thermoplastic elastomers – Polyurethanes

The thermoplastic elastomers demonstrate the characteristic properties of elastomers over a wide temperature range, but with the processing behavior of thermoplastics. They can be melted at high temperature and can be processed with traditional thermoplastic processing techniques. Thermoplastic elastomers are soluble and they generally swell less in comparison to their chemically cross-linked equivalents.

Elastomers

Elastomers are extremely flexible materials that can be expanded by exerting relatively little force. Because of their structure, elastomers have a high elasticity and resilience

and usually offer a good compression set. The rubber materials are polymers, which are formed by chemically cross-linked macromolecules with various vulcanization additives. Due to their chemical bonds, they do not melt, but rather begin to decompose at high temperatures. The cross-linking also stops the rubber materials from dissolving or, depending on the medium, swelling or shrinking.

Thermoplastics

Thermoplastics can be melted. They are essentially harder and more rigid at their application temperature compared to elastomers. Depending on the chemical structure, the properties vary from hard, to stiff, to ductile and flexible. Due to the morphological structure, extensive stretching is non-reversible and moulded parts remain in the deformed state. Engineering thermoplastics are used for back-up rings and guide rings, bushings, etc.

Thermoplastic elastomers – Polyurethanes

ECOPUR

ECOPUR is a thermoplastic polyurethane elastomer (TPU) with an excellent abrasion resistance, low compression set, high physical properties and tear strength. ECOPUR is mostly used for U-cup seals, lip seals, wipers and chevron packings, but it may also be used for dampers and other machined parts. Products made from this material can be used in mineral oil, in water up to 104 °F and in bio-degradable hydraulic oils like vegetable oils and synthetic esters up to 140 °F (in these hydraulic fluids, the use of H-ECOPUR instead of ECOPUR is recommended). Depending on the seal design and the installation housing, seals made of ECOPUR can be used up to 5,800 psi (for higher pressure anti-extrusion-rings are required).

ECOPUR LD

ECOPUR LD is a cast polyurethane elastomer (CPU) with similar properties to ECOPUR. Generally, ECOPUR LD is the standard polyurethane material used for seals in the diameter range between 23.6 inches and 47.2 inches.

G-ECOPUR

G-ECOPUR is a hydrolysis-resistant cast polyurethane elastomer (CPU) with similar properties to H-ECOPUR. Generally, G-ECOPUR is used for seals with a diameter range from 21.3 inches up to 157.5 inches as one piece and even larger when using a special welding technique.

H-ECOPUR

H-ECOPUR is a hydrolysis-resistant thermoplastic polyurethane elastomer (TPU). It combines the engineering properties of ECOPUR with a high resistance to hydrolysis (degradation in water), which is exceptional for polyurethanes. E.g. it is stable in water up to +194 °F and has outstanding stability in mineral oil. Because of its resistance to hydrolysis, H-ECOPUR can be used for water hydraulics and for applications in mining, tunnelling and manufacturing of presses, when fire resistance is required. H-ECOPUR



is particularly recommended for use in pure water and seawater, for HFA and HFB fluids, biologically degradable hydraulic fluids (vegetable oils and synthetic esters) and food articles. H-ECOPUR is approved for various food regulations.

S-ECOPUR

S-ECOPUR is a self-lubricated thermoplastic polyurethane elastomer (TPU) with solid lubricants optimized to reduce friction and improve wear resistance. This material is therefore best suited for most severe applications in water hydraulics as well as in non-lubricated pneumatics.

T-ECOPUR

T-ECOPUR is a thermoplastic polyurethane elastomer (TPU) for low temperature applications. The properties of T-ECOPUR are similar to those of ECOPUR, but the minimum service temperature is extended to -58 °F. For that reason, T-ECOPUR is most suitable for severe climatic conditions and processes for frozen goods.

Thermoplastic elastomers – Hard grade polyurethanes X-ECOPUR

X-ECOPUR is a hard grade thermoplastic polyurethane elastomer (TPU). This material provides outstanding friction reduction and wear resistance properties as well as high pressure resistance. Therefore, it is suitable for composite seals and for wipers working in heavy-duty applications.

Thanks to the exceptional extrusion resistance of this material, seals are working at higher pressure levels and larger clearances compared to those made of standard polyurethanes or PTFE compounds.

X-ECOPUR H

Compared to H-ECOPUR, X-ECOPUR H (TPU) has a significantly higher hardness. Thanks to an outstanding chemical and hydrolysis resistance, this material is recommended for applications with mineral oil, biodegradable hydraulic fluids (HETG and HEES, etc.) and water based fluids (HFA and HFB).



X-ECOPUR S

Compared to S-ECOPUR, X-ECOPUR S (TPU) is harder and has a better extrusion resistance. Therefore, this material can be used at higher pressures, assuming the same seal profiles are used.

X-ECOPUR S should be used instead of X-ECOPUR and X-ECOPUR H under poor lubricated working conditions. Depending on the overall service conditions, this material can also withstand dry-running.

Elastomers

SKF Ecoflas

SKF Ecoflas is a unique fluoro elastomer based on an alternating copolymer of tetra-fluoro-ethylene and propylene (TFE/P). Compared to fluoro rubber, it shows slightly higher tensile strength and a quite similar heat resistance. The resistance of SKF Ecoflas to mineral oils is similar to SKF Ecorubber-1/2/H. SKF Ecoflas has outstanding resistance to hot water and hot steam up to 446 °F as well as to sourgas and amines, brake fluids (based on glycol, mineral oil or silicon oil) and fire-resistant hydraulic fluids. In contrast to SKF Ecorubber-2, SKF Ecoflas has a good resistance to radiation.

SKF Ecorubber-H

SKF Ecorubber-H is a hydrogenated or saturated acrylonitrile-butadiene rubber (HNBR), suitable for applications with aliphatic hydrocarbons like propane or butane, mineral oils, greases (for short times up to 338 °F) and sulfonated crude oil. Furthermore, it can be used in many diluted acids, bases and salt solutions even at elevated temperatures and in glycol-water mixtures. SKF Ecorubber-H is not compatible with fuels that have a high content of aromatic hydrocarbons (premium blend petrol), gasolines (petrol/alcohol blends), ketones, esters, ethers and chlorinated hydrocarbons like trichloro-ethylene and tetrachloro-ethylene.

SKF Ecorubber-1

SKF Ecorubber-1 is an elastomer based on acrylonitrile-butadiene rubber (NBR) and is used for U-cup seals, chevron packings, special seals and various components. This material has good resistance to mineral oils and greases and HFA, HFB and HFC pressure fluids. However, the material is not resistant to glycol-based brake fluids, HFD fluids, aromatic fluids (such as benzene), esters, ketones and amines or concentrated acids and bases.

SKF Ecorubber-2

SKF Ecorubber-2 is an elastomer based on fluoro rubber (FKM) that can be used for U-rings, lip seals, chevron packings, wipers and special seals. Its outstanding properties are high resistance to heat, weathering, ozone and many other chemicals.

SKF Ecorubber-2 is compatible with mineral oils and greases containing sulphur, HFD pressure fluids (some phosphate esters and chlorinated hydrocarbons), crude oil and sour gas. SKF Ecorubber-2 is not resistant to anhydrous ammonia, amines, ketones, esters, hot water and low molecular weight organic acids.

SKF Ecorubber-3

SKF Ecorubber-3 is an elastomer based on ethylene-propylene rubber (EPDM) and can be used for U-cup seals, lip seals and chevron packings. SKF Ecorubber-3 has outstanding resistance to hot water, steam, washing agents and polar organic solvents. SKF Ecorubber-3 is not resistant to mineral oil and other unpolar media. Its resistance to weathering, ozone and ageing is good. When used in glycol-based brake fluids, governmental regulations have to be considered.

SKF Ecosil

SKF Ecosil is a silicone rubber (MVQ) and can be used for O-rings, gaskets and special seals. Due to its mechanical properties, it is mostly used for static applications. SKF Ecosil is highly resistant to weathering, ozone and ageing and it is compatible with mineral oil.



Thermoplastics

SKF Ecoflon 1

SKF Ecoflon 1 is a thermoplastic material based on polytetrafluoro-ethylene (PTFE-virgin) that is used for back-up rings, chevron packings, O-rings, rotary seals and gaskets. SKF Ecoflon 1 has an outstanding chemical resistance and will only be attacked by molten alkali metals and elementary fluorine at high temperatures. Using PTFE seals, it should be noted that creeping occurs at relatively low loads (pressure). SKF Ecoflon 1 is suitable for the food industry.

SKF Ecoflon 2

SKF Ecoflon 2 (PTFE + 15% glass fibre + 5% MoS₂) has improved compression strength as well as improved sliding properties compared to SKF Ecoflon 1.

The chemical resistance is similar to SKF Ecoflon 1.

SKF Ecoflon 3

SKF Ecoflon 3 (PTFE + 40% bronze) features improved compression strength, sliding properties and an improved thermal conductivity compared to SKF Ecoflon 1.

SKF Ecoflon 4

SKF Ecoflon 4 (PTFE + 25% carbon) has improved mechanical strength, stiffness and hardness as well as improved sliding properties compared to SKF Ecoflon 1.

SKF Ecoflon 5

SKF Ecoflon 5 (PTFE modified) has improved wear and abrasion resistance compared to SKF Ecoflon 1. The material is suitable for the food and beverage industry.

SKF Ecomid

SKF Ecomid is a cast polyamide (PA) with good sliding properties and is used for back-up rings, guide rings and bearing components instead of SKF Ecotal for diameters above 10.2 inches. SKF Ecomid can be used in mineral oils and some water-based fire-resistant hydraulic fluids. When designing parts of SKF Ecomid for an application in water or water-based fluids, the swelling of the material (SKF Ecomid absorbs water up to 8% of weight) must be taken into consideration.

SKF Ecopaek

SKF Ecopaek (PEEK) is a polymer with high tensile strength, stiffness, high heat distortion temperature and good sliding and friction behavior. As far as strength and stiffness are concerned, SKF Ecopaek exceeds most technical plastics especially at high temperatures.

SKF Ecotal

SKF Ecotal is a semi-crystalline polyacetal-copolymer (POM) which is used for anti-extrusion rings, guide rings, bushings, scrapers and for precision-machined parts with tight tolerances. SKF Ecotal has good mechanical properties, low water absorption and good chemical resistance. SKF Ecotal can be used in mineral oils and in water-based fire-resistant hydraulic fluids (HFA, HFB and HFC fluids). Concentrated acids and bases will attack and destroy it.

SKF Ecowear 1000

SKF Ecowear 1000 is a semi-crystalline thermoplastic material based on polyethylene (UHMWE-PE) with a molecular weight of about 9,920 lbs./mol. SKF Ecowear 1000 has a very low coefficient of friction, an excellent wear resistance and impact strength (also at low temperature down to -328 °F). Compared to SKF Ecoflon range, it has a very high creep resistance and is almost water repellent without any swelling. SKF Ecowear 1000 is recommended where outstanding sliding properties are required and in case of wear- and dry-running due to bad lubrication and aqueous media.

Thermosets

SKF Ecotex

SKF Ecotex is a compound based on a thermoset polyester resin (light orange) and reinforced with fabric inlays. Due to the addition of graphite, the material shows very good characteristics in respect to the tribological requirements in gliding systems. SKF Ecotex shows high compressive strength and outstanding friction reduction and wear resistance properties. Therefore, it is very well-suited for guide rings and bushings. Thanks to the very low tendency of absorbing moisture, SKF Ecotex is particularly suitable for use in water and media containing water (swelling in water < 0,1%).

Special materials

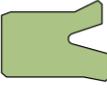
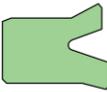
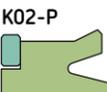
All standard materials can be modified to meet specific application requirements. Contact SKF for more information.

General remark for technical data

The stated operating parameters represent general conditions. It is recommended NOT to use all maximum values simultaneously. The specified pressure limits apply for use in mineral oil with a maximum temperature of 140 °F and a maximum metal extrusion gap of 0.010 inches. The speed limits apply for adequate lubrication and running surface finishes as recommended. SKF also recommends to test material / media compatibility and sealing function for targeted performance under real working conditions. These tests are provided as a service by SKF, upon customers' request. Depending on application details, higher pressures and speed limits can be attained in most cases. If any of the indicated limits do not meet specific requirements, please contact SKF.

Piston seals

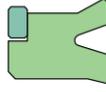
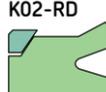
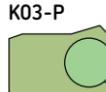
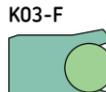
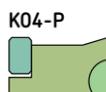
 Linear moving
  Rotating
  Oscillating
  Spiral moving
  Static
 Grey symbols: contact SKF for application limitations

Appli- Profile cation	Description	Temperature		Speed max.	Pressure max.	Material		
		min.	max.					
		°F		ft/s	psi	–		
 K01-P  	Hydraulic, single acting Asymmetric piston seal for standard applications. Design provides stable fit in the housing, ultimate sealing effect over a wide temperature range. Prevents extensive drag pressure. Back-to-back arrangement with guide ring in between for double-acting pistons or to separate different fluids.	-22	+230	1.64	5,800	ECOPUR		
		-31	+230	1.64	5,800	ECOPUR LD		
		-22	+230	1.64	5,800	G-ECOPUR		
		-4	+230	1.64	5,800	H-ECOPUR		
		-4	+230	2.30	5,800	S-ECOPUR		
-58	+230	1.64	5,800	T-ECOPUR				
 K01-PE  	Hydraulic, single acting Asymmetric piston seal for standard applications as K01-P, but with increased contact force designed for single acting pistons.	-22	+230	1.64	5,800	ECOPUR		
		-31	+230	1.64	5,800	ECOPUR LD		
		-22	+230	1.64	5,800	G-ECOPUR		
		-4	+230	1.64	5,800	H-ECOPUR		
		-4	+230	2.30	5,800	S-ECOPUR		
-58	+230	1.64	5,800	T-ECOPUR				
 K01-R  	Hydraulic, single acting As profile K01-P, but more easily adaptable to diverse temperatures and media by selection of suitable seal material.	+14	+392	1.64	2,300	SKF Ecoflas		
		-13	+302	1.64	2,300	SKF Ecorubber-H		
		-22	+212	1.64	2,300	SKF Ecorubber-1		
		-4	+392	1.64	2,300	SKF Ecorubber-2		
		-58	+302	1.64	2,300	SKF Ecorubber-3 ²⁾		
-76	+392	–	–	SKF Ecosil ³⁾				
 K01-RE  	Hydraulic, single acting Asymmetric piston seal for standard applications as K01-R, but with increased contact force designed for single acting pistons.	+14	+392	1.64	2,300	SKF Ecoflas		
		-13	+302	1.64	2,300	SKF Ecorubber-H		
		-22	+212	1.64	2,300	SKF Ecorubber-1		
		-4	+392	1.64	2,300	SKF Ecorubber-2		
		-58	+302	1.64	2,300	SKF Ecorubber-3 ²⁾		
-76	+392	–	–	SKF Ecosil ³⁾				
 K02-P  	Hydraulic, single acting Asymmetric piston seal for standard applications as K01-P, but thanks to design with active back-up ring, it is suitable for higher pressure range or larger extrusion gaps. K02-P for standard housing design.	-22	+212	1.64	10,000	Seal ECOPUR	Back-up ring SKF Ecotal ¹⁾	
		-31	+212	1.64	10,000	ECOPUR LD	SKF Ecomid	
		-22	+212	1.64	10,000	G-ECOPUR	SKF Ecomid	
		-4	+212	1.64	10,000	H-ECOPUR	SKF Ecotal ¹⁾	
		-4	+212	2.30	10,000	S-ECOPUR	SKF Ecotal ¹⁾	
-40	+212	1.64	10,000	T-ECOPUR	SKF Ecotal ¹⁾			
 K02-PD  	Hydraulic, single acting Asymmetric piston seal for standard applications as K01-P, but thanks to design with active back-up ring, it is suitable for higher pressure or larger extrusion gaps. K02-PD for small housing design.	-22	+212	1.64	10,000	Seal ECOPUR	Back-up ring SKF Ecotal ¹⁾	O-ring NBR 70
		-31	+212	1.64	10,000	ECOPUR LD	SKF Ecomid	NBR 70
		-22	+212	1.64	10,000	G-ECOPUR	SKF Ecomid	NBR 70
		-4	+212	1.64	10,000	H-ECOPUR	SKF Ecotal ¹⁾	NBR 70
		-4	+212	2.30	10,000	S-ECOPUR	SKF Ecotal ¹⁾	NBR 70
-40	+212	1.64	10,000	T-ECOPUR	SKF Ecotal ¹⁾	SKF Ecotal ¹⁾	MVQ 70	

¹⁾ SKF Ecotal up to Ø 10.24 inches, SKF Ecomid above Ø 10.24 inches
²⁾ Not suitable for mineral oils
³⁾ Only recommended for static or quasi-static applications. Contact SKF for more information

Piston seals

 Linear moving
  Rotating
  Oscillating
  Spiral moving
  Static
 Grey symbols: contact SKF for application limitations

Appli- Profile cation	Description	Temperature		Speed max.	Pressure max.	Material		
		min.	max.			Seal	Back-up ring	
		°F		ft/s	psi	–	–	
 K02-R  	Hydraulic, single-acting As profile K02-P, but more easily adaptable to diverse temperatures and media by selection of suitable seal material. K02-R for standard housing design.	-13	+302	1.64	3,600	Seal SKF Ecorubber-H	Back-up ring SKF Ecoflon 2	
		-13	+212	1.64	3,600	SKF Ecorubber-H	SKF Ecotal ¹⁾	
		-22	+212	1.64	3,600	SKF Ecorubber-1	SKF Ecotal ¹⁾	
		-4	+392	1.64	3,600	SKF Ecorubber-2	SKF Ecoflon 2	
		-40	+212	1.64	3,600	SKF Ecorubber-3 ²⁾	SKF Ecotal ¹⁾	
-58	+302	1.64	3,600	SKF Ecorubber-3 ²⁾	SKF Ecoflon 2			
+14	+392	1.64	3,600	SKF Ecoflas	SKF Ecopaek			
 K02-RD  	Hydraulic, single-acting As profile K02-P, but more easily adaptable to diverse temperatures and media by selection of suitable seal material. K02-RD for small housing design.	-13	+302	1.64	3,600	Seal SKF Ecorubber-H	Back-up ring SKF Ecoflon 2	
		-13	+212	1.64	3,600	SKF Ecorubber-H	SKF Ecotal ¹⁾	
		-22	+212	1.64	3,600	SKF Ecorubber-1	SKF Ecotal ¹⁾	
		-4	+392	1.64	3,600	SKF Ecorubber-2	SKF Ecoflon 2	
		-40	+212	1.64	3,600	SKF Ecorubber-3 ²⁾	SKF Ecotal ¹⁾	
-58	+302	1.64	3,600	SKF Ecorubber-3 ²⁾	SKF Ecoflon 2			
+14	+392	1.64	3,600	SKF Ecoflas	SKF Ecopaek			
 K03-P  	Hydraulic, single-acting O-ring activated, asymmetrical piston seal. Interference fit on inside diameter maintains stable fit in the housing. Design provides ultimate sealing effect. Especially suitable for short stroke applications (e.g. spindle seals, coupling actuators...)	-22	+212	1.64	5,800	Seal ECOPUR	O-ring NBR 70	
		-22	+212	1.64	5,800	ECOPUR LD	NBR 70	
		-22	+212	1.64	5,800	G-ECOPUR	NBR 70	
		-4	+212	1.64	5,800	H-ECOPUR	NBR 70	
		-4	+212	2.30	5,800	S-ECOPUR	NBR 70	
-58	+230	1.64	5,800	T-ECOPUR	MVQ 70			
 K03-F  	PTFE-piston seal, single-acting O-ring activated, asymmetrical PTFE piston seal, low friction and no stick-slip effect. Easily adaptable for diverse temperatures and media by selection of suitable O-ring material, almost no dead spots as required for applications in food and pharma industry.	-67	+392	3.28	2,900	Seal SKF Ecoflon 1	O-ring MVQ 70	
		-22	+212	3.28	2,900	SKF Ecoflon 1	NBR 70	
		-58	+302	3.28	5,800	SKF Ecoflon 2,3,4	EPDM	
		-4	+392	3.28	5,800	SKF Ecoflon 2,3,4	FPM 75	
		-67	+392	3.28	5,800	SKF Ecoflon 2,3,4	MVQ 70	
-22	+212	3.28	5,800	SKF Ecoflon 2,3,4	NBR 70			
-67	+194	1.64	2,900	SKF Ecowear 1000	MVQ 70			
-22	+194	1.64	2,900	SKF Ecowear 1000	NBR 70			
 K03-S  	PTFE-piston seal, single-acting Helicoil spring activated, asymmetrical PTFE piston seal, low friction and no stick-slip effect, excellent chemical and thermal resistance, mainly used in chemical, pharma and food industry or for valves.	-328	+500	3.28	2,900	Seal SKF Ecoflon 1	Spring 1.4310 ³⁾	
		-328	+500	3.28	5,800	SKF Ecoflon 2,3,4	1.4310 ³⁾	
		-328	+194	1.64	2,900	SKF Ecowear 1000	1.4310 ³⁾	
 K04-P  	Hydraulic, single-acting Asymmetric piston seal for standard applications as K03-P, but thanks to design with active back-up ring, it is suitable for larger extrusion gaps or higher pressure. K04-P for standard housing design.	-22	+212	1.64	10,000	Seal ECOPUR	Back-up ring SKF Ecotal ¹⁾	O-ring NBR 70
		-22	+212	1.64	10,000	ECOPUR LD	SKF Ecomid	NBR 70
		-22	+212	1.64	10,000	G-ECOPUR	SKF Ecomid	NBR 70
		-4	+212	1.64	10,000	H-ECOPUR	SKF Ecotal ¹⁾	NBR 70
		-4	+212	2.30	10,000	S-ECOPUR	SKF Ecotal ¹⁾	NBR 70
-40	+212	1.64	10,000	T-ECOPUR	SKF Ecotal ¹⁾	MVQ 70		

¹⁾ SKF Ecotal up to Ø 10.24 inches, SKF Ecomid above Ø 10.24 inches
²⁾ Not suitable for mineral oils
³⁾ Spring steel material specification

Piston seals

Linear moving
 Rotating
 Oscillating
 Spiral moving
 Static
 Grey symbols: contact SKF for application limitations

Appli- Profile cation	Description	Temperature		Speed max.	Pressure max.	Material		
		min.	max.			Seal	Back-up ring	O-ring
		°F		ft/s	psi	-		
K04-PD 	Hydraulic, single-acting Asymmetric piston seal for standard applications as K03-P, but thanks to design with active back-up ring, it is suitable for larger extrusion gaps. K04-PD for small housing design.	-22	+212	1.64	10,000	Seal	Back-up ring	O-ring
		ECOPUR	SKF Ecotal ¹⁾	NBR 70				
		ECOPUR LD	SKF Ecomid	NBR 70				
		G-ECOPUR	SKF Ecomid	NBR 70				
		H-ECOPUR	SKF Ecotal ¹⁾	NBR 70				
		S-ECOPUR	SKF Ecotal ¹⁾	NBR 70				
T-ECOPUR	SKF Ecotal ¹⁾	MVQ 70						
K05-P 	Pneumatic, single-acting Asymmetric piston seal, extremely wear resistant, for use in lubricated or dry pneumatic applications. Special design of sealing lip allows retention of initial lubricating film.	-22	+230	3.28	360	Seal		
		ECOPUR						
		ECOPUR LD						
		G-ECOPUR						
		H-ECOPUR						
		S-ECOPUR						
T-ECOPUR								
K05-R 	Pneumatic, single-acting Asymmetric piston seal, good wear resistant, for use in lubricated or dry pneumatic applications. Easily adaptable for diverse temperatures and media by selection of suitable seal material. Special design of sealing lip allows retention of initial lubricating film.	+14	+392	3.28	360	SKF Ecoflas		
		-13	+302	3.28	360	SKF Ecorubber-H		
		-22	+212	3.28	360	SKF Ecorubber-1		
		-4	+392	3.28	360	SKF Ecorubber-2		
		-58	+302	3.28	360	SKF Ecorubber-3 ²⁾		
K06-P 	Hydraulic, single-acting Symmetric piston seal for simple standard applications, not recommended for new designs (profile K01-P preferred). Also, for larger cross section, easier to install.	-22	+230	1.64	5,800	ECOPUR		
		-31	+230	1.64	5,800	ECOPUR LD		
		-22	+230	1.64	5,800	G-ECOPUR		
		-4	+230	1.64	5,800	H-ECOPUR		
		-4	+230	2.30	5,800	S-ECOPUR		
		-58	+230	1.64	5,800	T-ECOPUR		
K06-R 	Hydraulic, single-acting As profile K06-P, but more easily adaptable for diverse temperatures and media by selection of suitable seal material. Also, for larger cross section, easier to install.	+14	+392	1.64	2,300	SKF Ecoflas		
		-13	+302	1.64	2,300	SKF Ecorubber-H		
		-22	+212	1.64	2,300	SKF Ecorubber-1		
		-4	+392	1.64	2,300	SKF Ecorubber-2		
		-58	+302	1.64	2,300	SKF Ecorubber-3 ²⁾		
		-76	+392	-	-	SKF Ecosil ³⁾		
K07-P 	Hydraulic, single-acting O-ring activated symmetric piston seal for simple standard applications, not recommended for new designs (profile K03-P preferred).	-22	+212	1.64	5,800	Seal	O-ring	
		ECOPUR	NBR 70					
		ECOPUR LD	NBR 70					
		G-ECOPUR	NBR 70					
		H-ECOPUR	NBR 70					
		S-ECOPUR	NBR 70					
T-ECOPUR	MVQ 70							

¹⁾ SKF Ecotal up to Ø 10.24 inches, SKF Ecomid above Ø 10.24 inches
²⁾ Not suitable for mineral oils
³⁾ Only recommended for static or quasi-static applications. Contact SKF for more information

Piston seals

Linear moving
 Rotating
 Oscillating
 Spiral moving
 Static
 Grey symbols: contact SKF for application limitations

Appli- Profile cation	Description	Temperature		Speed max.	Pressure max.	Material				
		min.	max.			Seal	Glide ring	O-ring		
		°F		ft/s	psi	-				
K07-F 	PTFE piston seal, single-acting O-ring activated symmetric PTFE piston seal, low friction and no stick-slip effect for simple standard applications, not recommended for new designs (profile K03-F preferred)	-22	+212	3.28	2,900	Seal		O-ring		
		-67	+392	3.28	2,900	SKF Ecoflon 1		NBR 70		
		-22	+212	3.28	5,800	SKF Ecoflon 2,3,4		NBR 70		
		-4	+392	3.28	5,800	SKF Ecoflon 2,3,4		FPM 75		
		-58	+302	3.28	5,800	SKF Ecoflon 2,3,4		EPDM		
		-67	+392	3.28	5,800	SKF Ecoflon 2,3,4		MVQ 70		
		-22	+194	1.64	2,900	SKF Ecowear 1000		NBR 70		
		-67	+194	1.64	2,900	SKF Ecowear 1000		MVQ 70		
		K08-E 	Hydraulic, single-acting O-ring activated asymmetric PTFE piston seal, low friction. For extreme low or high speed. Suitable for positioning functions.	-67	+230	16.40	8,700	Glide ring	O-ring	
				-22	+212	16.40	8,700	G-ECOPUR 54D		MVQ 70
				-67	+230	16.40	8,700	G-ECOPUR 54D		NBR 70
-22	+212			16.40	8,700	X-ECOPUR, H, S		NBR 70		
-4	+392			32.81	8,700	X-ECOPUR, H, S		NBR 70		
-22	+212			32.81	8,700	SKF Ecoflon 2,3,4		FPM 75		
-67	+194			16.40	5,800	SKF Ecoflon 2,3,4		NBR 70		
-22	+194			16.40	5,800	SKF Ecowear 1000		MVQ 70		
-22	+194			16.40	5,800	SKF Ecowear 1000		NBR 70		
K08-D 	Hydraulic, double acting O-ring activated symmetric PTFE piston seal, low friction. For extreme low or high speed, suitable for positioning functions. For mobile hydraulics, machine tools, injection moulding machines, heavy hydraulics.			-67	+230	16.40	8,700	Glide ring	O-ring	
				-22	+212	16.40	8,700	G-ECOPUR 54D		MVQ 70
		-67	+230	16.40	8,700	G-ECOPUR 54D		NBR 70		
		-22	+212	16.40	8,700	X-ECOPUR, H, S		MVQ 70		
		-4	+392	32.81	8,700	X-ECOPUR, H, S		NBR 70		
		-22	+212	32.81	8,700	SKF Ecoflon 2,3,4		FPM 75		
		-67	+194	16.40	5,800	SKF Ecoflon 2,3,4		NBR 70		
		-22	+194	16.40	5,800	SKF Ecowear 1000		MVQ 70		
		-22	+194	16.40	5,800	SKF Ecowear 1000		NBR 70		
		K08-P 	Hydraulic, double-acting O-ring activated symmetric PU piston seal with excellent static and dynamic sealing capacity, extremely wear resistant.	-22	+212	3.28	3,600	Glide ring	O-ring	
				-22	+212	3.28	3,600	ECOPUR		NBR 70
-22	+212			3.28	3,600	ECOPUR LD		NBR 70		
-4	+212			3.28	3,600	G-ECOPUR		NBR 70		
-4	+212			3.28	3,600	H-ECOPUR		NBR 70		
-4	+212			4.59	3,600	S-ECOPUR		NBR 70		
-58	+212			3.28	3,600	T-ECOPUR		MVQ 70		
K08-ES 	Hydraulic, single-acting Profile ring-activated asymmetric PTFE piston seal, similar to K08-E, but special heavy duty design. For heavy industry hydraulics or for special housing dimensions.			-22	+212	16.40	8,700	Glide ring	O-ring	
				-76	+230	16.40	8,700	G-ECOPUR 54D		SKF Ecorubber-1
				-22	+212	16.40	8,700	G-ECOPUR 54D		SKF Ecosil
				-76	+212	16.40	8,700	X-ECOPUR, H, S		SKF Ecorubber-1
		-22	+212	32.81	8,700	X-ECOPUR, H, S		SKF Ecosil		
		-4	+392	32.81	8,700	SKF Ecoflon 2,3,4		SKF Ecorubber-1		
		-22	+194	16.40	5,800	SKF Ecoflon 2,3,4		SKF Ecorubber-2		
		-76	+194	16.40	5,800	SKF Ecoflon 2,3,4		SKF Ecorubber-1		
		-22	+194	16.40	5,800	SKF Ecowear 1000		SKF Ecorubber-1		
		-76	+194	16.40	5,800	SKF Ecowear 1000		SKF Ecosil		
		K08-DS 	Hydraulic, double-acting Profile ring-activated symmetric PTFE piston seal, similar to S09-D, but special heavy duty design. For heavy industry hydraulics or for special housing dimensions.	-22	+212	16.40	8,700	Glide ring	O-ring	
-76	+230			16.40	8,700	G-ECOPUR 54D		SKF Ecorubber-1		
-22	+212			16.40	8,700	G-ECOPUR 54D		SKF Ecosil		
-76	+212			16.40	8,700	X-ECOPUR, H, S		SKF Ecorubber-1		
-4	+392			32.81	8,700	X-ECOPUR, H, S		SKF Ecosil		
-22	+212			32.81	8,700	SKF Ecoflon 2,3,4		SKF Ecorubber-1		
-4	+392			32.81	8,700	SKF Ecoflon 2,3,4		SKF Ecorubber-2		
-22	+194			16.40	5,800	SKF Ecoflon 2,3,4		SKF Ecorubber-1		
-76	+194			16.40	5,800	SKF Ecoflon 2,3,4		SKF Ecorubber-1		
-22	+194			16.40	5,800	SKF Ecowear 1000		SKF Ecorubber-1		
-76	+194			16.40	5,800	SKF Ecowear 1000		SKF Ecosil		

Piston seals

Linear moving
 Rotating
 Oscillating
 Spiral moving
 Static
 Grey symbols: contact SKF for application limitations

Appli- Profile cation	Description	Temperature Speed Pressure				Material		
		min.	max.	max.	max.			
		°F	ft/s	psi	–			
	K09-N Hydraulic, double-acting Profile ring-activated compact piston seal with integrated guiding elements. Excellent static sealing capacity. Commonly used in standard cylinders.	-22	+212	1.64	5,800	Seal ECO PUR H-ECOPUR S-ECOPUR T-ECOPUR	Energizer SKF Ecorubber-1 SKF Ecorubber-1 SKF Ecorubber-1 SKF Ecosil	Back-up SKF Ecotal ⁽¹⁾ SKF Ecotal ⁽¹⁾ SKF Ecotal ⁽¹⁾ SKF Ecotal ⁽¹⁾
		-4	+212	1.64	5,800			
		-4	+212	2.30	5,800			
		-58	+212	1.64	5,800			
	K09-D Hydraulic, double-acting Profile ring-activated compact piston seal with integrated guiding elements. Excellent static and dynamic sealing capacity.	-22	+212	1.64	5,800	Seal ECO PUR H-ECOPUR S-ECOPUR T-ECOPUR	Energizer SKF Ecorubber-1 SKF Ecorubber-1 SKF Ecorubber-1 SKF Ecosil	Back-up SKF Ecotal ⁽¹⁾ SKF Ecotal ⁽¹⁾ SKF Ecotal ⁽¹⁾ SKF Ecotal ⁽¹⁾
		-4	+212	1.64	5,800			
		-4	+212	2.30	5,800			
		-58	+212	1.64	5,800			
	K09-H Hydraulic, double-acting Profile ring-activated compact piston seal with integrated guiding elements. Design for high pressure range, excellent static sealing capacity. Mainly used in mining / tunneling industry.	-22	+212	0.98	21,700	Seal ECO PUR H-ECOPUR S-ECOPUR T-ECOPUR	Energizer SKF Ecorubber-1 SKF Ecorubber-1 SKF Ecorubber-1 SKF Ecosil	Back-up SKF Ecotal ⁽¹⁾ SKF Ecotal ⁽¹⁾ SKF Ecotal ⁽¹⁾ SKF Ecotal ⁽¹⁾
		-4	+212	0.98	21,700			
		-4	+212	1.31	21,700			
		-58	+212	0.98	21,700			
	K09-F Hydraulic, double-acting Profile ring-activated compact PTFE piston seal with integrated guiding elements. Low friction, good chemical and thermal resistance.	-22	+212	3.28	5,800	Seal X-ECOPUR X-ECOPUR H X-ECOPUR S SKF Ecoflon 2,3,4 SKF Ecoflon 2,3,4	Energizer SKF Ecorubber-1 SKF Ecorubber-1 SKF Ecorubber-1 SKF Ecorubber-2	Back-up ring SKF Ecotal ⁽¹⁾ SKF Ecotal ⁽¹⁾ SKF Ecotal ⁽¹⁾ SKF Ecotal ⁽¹⁾ SKF Ecotal ⁽¹⁾
		-22	+212	3.28	5,800			
		-22	+212	3.94	5,800			
		-22	+212	4.92	5,800			
	K1012-T Hydraulic, single-acting Chevron sealing set, machined surface design. In back-to-back arrangement with one intermediate chevron for double sided pressure activation, in single-acting applications with more intermediate chevrons possible. For heavy industry hydraulics.	-22	+212	1.64	7,200	K 10-A SKF Ecotal ⁽¹⁾ SKF Ecomid SKF Ecomid SKF Ecotal ⁽¹⁾ SKF Ecotal ⁽¹⁾ SKF Ecoflon 2 SKF Ecoflon 2 SKF Ecoflon 2 SKF Ecoflon 2	K 11-T ECO PUR ECO PUR LD G-ECOPUR H-ECOPUR S-ECOPUR SKF Ecorubber-H SKF Ecorubber-1 SKF Ecorubber-2 SKF Ecorubber-3	K 12-T X-ECOPUR ⁽²⁾ SKF Ecomid G-ECOPUR 54D ⁽³⁾ X-ECOPUR H ⁽²⁾ X-ECOPUR S ⁽²⁾ SKF Ecoflon 2 SKF Ecoflon 2 SKF Ecoflon 2 SKF Ecoflon 2
		-31	+212	1.64	7,200			
		-22	+212	2.30	7,200			
		-4	+212	1.64	7,200			
	K1012-M Hydraulic, single-acting Chevron sealing set, parted surface design. In back-to-back arrangement with one intermediate chevron for double sided pressure activation, in single-acting applications with more intermediate chevrons possible. For heavy industry hydraulics.	-22	+212	1.64	7,200	K 10-A SKF Ecotal ⁽¹⁾ SKF Ecomid SKF Ecomid SKF Ecotal ⁽¹⁾ SKF Ecotal ⁽¹⁾ SKF Ecoflon 2 SKF Ecoflon 2 SKF Ecoflon 2 SKF Ecoflon 2	K 11-M ECO PUR ECO PUR LD G-ECOPUR H-ECOPUR S-ECOPUR SKF Ecorubber-H SKF Ecorubber-1 SKF Ecorubber-2 SKF Ecorubber-3	K 12-M X-ECOPUR ⁽²⁾ SKF Ecomid G-ECOPUR 54D ⁽³⁾ X-ECOPUR H ⁽²⁾ X-ECOPUR S ⁽²⁾ SKF Ecoflon 2 SKF Ecoflon 2 SKF Ecoflon 2 SKF Ecoflon 2
		-31	+212	1.64	7,200			
		-22	+212	2.30	7,200			
		-4	+212	1.64	7,200			

¹⁾ SKF Ecotal up to Ø 10.24 inches, SKF Ecomid above Ø 10.24 inches
²⁾ Alternative SKF Ecotal up to Ø 10.24 inches, SKF Ecomid above Ø 10.24 inches
³⁾ Alternative SKF Ecomid

Piston seals

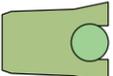
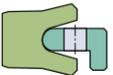
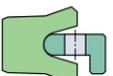
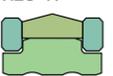
Linear moving
 Rotating
 Oscillating
 Spiral moving
 Static
 Grey symbols: contact SKF for application limitations

Appli- Profile cation	Description	Temperature Speed Pressure				Material		
		min.	max.	max.	max.			
		°F	ft/s	psi	–			
	K1315-T Hydraulic, single-acting Chevron sealing set, design with flexible sealing lips, good sealing ability in higher pressure range. For heavy industry hydraulics, water-hydraulic systems.	-22	+212	1.64	8,700	K 13-T SKF Ecotal ⁽¹⁾ SKF Ecotal ⁽¹⁾ SKF Ecomid SKF Ecomid SKF Ecotal ⁽¹⁾ SKF Ecotal ⁽¹⁾ SKF Ecotal ⁽¹⁾ SKF Ecotal ⁽¹⁾ SKF Ecotal ⁽¹⁾ SKF Ecotal ⁽¹⁾	K 14-T ECO PUR ECO PUR LD G-ECOPUR H-ECOPUR H-ECOPUR S-ECOPUR S-ECOPUR T-ECOPUR	K 15-T X-ECOPUR SKF Ecotal ⁽¹⁾ SKF Ecomid SKF Ecomid X-ECOPUR H SKF Ecotal ⁽¹⁾ X-ECOPUR S SKF Ecotal ⁽¹⁾ SKF Ecotal ⁽¹⁾
		-22	+212	1.64	8,700			
		-31	+212	1.64	8,700			
		-22	+212	1.64	8,700			
		-4	+212	1.64	8,700			
		-4	+212	1.64	8,700			
		-4	+212	2.30	8,700			
		-4	+212	2.30	8,700			
		-40	+212	1.64	8,700			
			K16-A Hydraulic/pneumatic, single-acting Simple cup seal, usually fixed on the piston by means of a clamping plate. Mainly used for replacement in old hydraulic and pneumatic cylinders or for low-grade secondary applications. Also used for food filling / portioning equipment.	-22	+230			
-31	+230			1.64	2,300			
-22	+230			1.64	2,300			
-4	+230			1.64	2,300			
-4	+230			2.30	2,300			
-58	+230			1.64	2,300			
+14	+392			1.64	2,300			
-13	+302			1.64	2,300			
-22	+212			1.64	2,300			
-4	+392			1.64	2,300			
	K16-B Hydraulic/pneumatic, single-acting Simple cup seal, usually fixed on the piston by means of a clamping plate. Mainly used for replacement in old hydraulic and pneumatic cylinders or for low-grade secondary applications. Also used for food filling / portioning equipment.	-22	+230	1.64	2,300	ECO PUR ECO PUR LD G-ECOPUR H-ECOPUR S-ECOPUR T-ECOPUR SKF Ecoflas SKF Ecorubber-H SKF Ecorubber-1 SKF Ecorubber-2 SKF Ecorubber-3		
		-31	+230	1.64	2,300			
		-22	+230	1.64	2,300			
		-4	+230	1.64	2,300			
		-4	+230	2.30	2,300			
		-58	+230	1.64	2,300			
		+14	+392	1.64	2,300			
		-13	+302	1.64	2,300			
		-22	+212	1.64	2,300			
		-4	+392	1.64	2,300			
	K17-P Hydraulic, double-acting Space saving, compact piston seal with integrated guiding elements. Excellent static sealing capacity, suitable for small housings.	-22	+212	1.64	3,600	Seal ECO PUR H-ECOPUR S-ECOPUR T-ECOPUR	Back-up ring SKF Ecotal ⁽¹⁾ SKF Ecotal ⁽¹⁾ SKF Ecotal ⁽¹⁾ SKF Ecotal ⁽¹⁾	
		-4	+212	1.64	3,600			
		-4	+212	2.30	3,600			
		-40	+212	1.64	3,600			
	K17-R Hydraulic, double-acting Space saving, compact piston seal with integrated guiding elements. Excellent static sealing capacity, easily adaptable for diverse temperatures and media by selection of suitable material. Suitable for small housings.	-13	+302	1.64	3,600	Seal SKF Ecorubber-H SKF Ecorubber-H SKF Ecorubber-H SKF Ecorubber-1 SKF Ecorubber-2 SKF Ecorubber-2	Back-up ring SKF Ecoflon 2 SKF Ecopaek SKF Ecotal ⁽¹⁾ SKF Ecotal ⁽¹⁾ SKF Ecoflon 2 SKF Ecopaek	
		-13	+302	1.64	3,600			
		-13	+212	1.64	3,600			
		-22	+212	1.64	3,600			
		-4	+392	1.64	3,600			
		-4	+392	1.64	3,600			
	K19-F PTFE piston seal, single-acting Finger-spring activated, asymmetrical PTFE piston seal, low friction and good dry running properties, excellent chemical and thermal resistance, mainly used in chemical, pharma and food industry.	-328	+500	49.21	2,900	Seal SKF Ecoflon 1 SKF Ecoflon 2 SKF Ecoflon 3 SKF Ecoflon 4 SKF Ecowear 1000	Spring 1.4310 ⁽²⁾ 1.4310 ⁽²⁾ 1.4310 ⁽²⁾ 1.4310 ⁽²⁾ 1.4310 ⁽²⁾	
		-328	+500	49.21	5,800			
		-328	+500	49.21	5,800			
		-328	+500	49.21	5,800			
		-328	+194	49.21	2,900			
		-328	+194	49.21	2,900			

¹⁾ SKF Ecotal up to Ø 10.24 inches, SKF Ecomid above Ø 10.24 inches
²⁾ Spring steel material specification

Piston seals

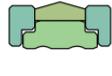
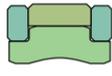
 Linear moving
  Rotating
  Oscillating
  Spiral moving
  Static
 Grey symbols: contact SKF for application limitations

Appli- Profile cation	Description	Temperature		Speed max.	Pressure max.	Material		
		min.	max.			–	–	
		°F		ft/s	psi			
 	Hydraulic, double-acting Space saving, compact piston seal, suitable for standard O-Ring housings. Advantage compared to O-Ring: integrated active back-up rings for high pressure, designed with interference fit on outside diameter, prevents twisting in dynamic applications.	-13	+302	1.64	10,000	Seal SKF Ecorubber-H	Back-up ring SKF Ecoflon 2	
		-13	+302	1.64	10,000	SKF Ecorubber-H	SKF Ecopaek	
		-13	+212	1.64	10,000	SKF Ecorubber-H	SKF Ecotal ¹⁾	
		-22	+212	1.64	10,000	SKF Ecorubber-1	SKF Ecotal ¹⁾	
		-4	+392	1.64	10,000	SKF Ecorubber-2	SKF Ecoflon 2	
 	Hydraulic, single-acting O-Ring activated symmetric piston seal with sharp-edged sealing lips, good sealing effect for high viscosity fluids, not recommended for new designs (Profile K03-P preferred).	-22	+212	1.64	5,800	Seal ECOPUR	O-ring NBR 70	
		-4	+212	1.64	5,800	H-ECOPUR	NBR 70	
		-4	+212	2.30	5,800	S-ECOPUR	NBR 70	
		-58	+230	1.64	5,800	T-ECOPUR	MVQ 70	
 	Hydraulic, single-acting Symmetric piston seal with support ring for simple applications to serve repair purpose, not recommended for new designs (Profile K01-P preferred). Retainer ring can be designed straight or as an angled ring.	-22	+212	1.64	5,800	Seal ECOPUR	Support ring SKF Ecotal ¹⁾	
		-31	+212	1.64	5,800	ECOPUR LD	SKF Ecomid	
		-22	+212	1.64	5,800	G-ECOPUR	SKF Ecomid	
		-4	+212	1.64	5,800	H-ECOPUR	SKF Ecotal ¹⁾	
		-4	+212	2.30	5,800	S-ECOPUR	SKF Ecotal ¹⁾	
 	Hydraulic, single-acting Symmetric piston seal as K22-P, but easily adaptable for diverse temperatures and media by selection of suitable seal material. Retainer ring can be designed straight or as an angled ring.	+14	+392	1.64	2,300	Seal SKF Ecoflas	Support ring SKF Ecoflon	
		-13	+302	1.64	2,300	SKF Ecorubber-H	SKF Ecoflon 2	
		-13	+212	1.64	2,300	SKF Ecorubber-H	SKF Ecotal ¹⁾	
		-22	+212	1.64	2,300	SKF Ecorubber-1	SKF Ecotal ¹⁾	
		-4	+392	1.64	2,300	SKF Ecorubber-2	SKF Ecoflon 2	
 	Hydraulic, double-acting Profile ring-activated compact piston seal with integrated back-up rings, excellent static sealing capacity. External guiding elements required.	-22	+212	1.64	5,800	Seal ECOPUR	Energizer SKF Ecorubber-1	Back-up rings SKF Ecotal ¹⁾
		-4	+212	1.64	5,800	H-ECOPUR	SKF Ecorubber-1	SKF Ecotal ¹⁾
		-4	+212	2.30	5,800	S-ECOPUR	SKF Ecorubber-1	SKF Ecotal ¹⁾
		-40	+212	1.64	5,800	T-ECOPUR	SKF Ecosil	SKF Ecotal ¹⁾
 	Hydraulic, double-acting Profile ring-activated compact piston seal with integrated back-up rings. Excellent static and dynamic sealing capacity. External guiding elements required.	-22	+212	1.64	5,800	Seal ECOPUR	Energizer SKF Ecorubber-1	Back-up rings SKF Ecotal ¹⁾
		-4	+212	1.64	5,800	H-ECOPUR	SKF Ecorubber-1	SKF Ecotal ¹⁾
		-4	+212	2.30	5,800	S-ECOPUR	SKF Ecorubber-1	SKF Ecotal ¹⁾
		-40	+212	1.64	5,800	T-ECOPUR	SKF Ecosil	SKF Ecotal ¹⁾

¹⁾ SKF Ecotal up to Ø 10.24 inches, SKF Ecomid above Ø 10.24 inches
²⁾ Not suitable for mineral oils

Piston seals

 Linear moving
  Rotating
  Oscillating
  Spiral moving
  Static
 Grey symbols: contact SKF for application limitations

Appli- Profile cation	Description	Temperature		Speed max.	Pressure max.	Material		
		min.	max.			–	–	–
		°F		ft/s	psi			
 	Hydraulic, double-acting Profile ring-activated compact piston seal with integrated back-up rings. Designed for high pressure range, excellent static sealing capacity. Mainly used in mining / tunneling industry. External guiding elements required.	-22	+212	0.98	21,000	Seal ECOPUR	Energizer SKF Ecorubber-1	Back-up rings SKF Ecotal ¹⁾
		-4	+212	0.98	21,000	H-ECOPUR	SKF Ecorubber-1	SKF Ecotal ¹⁾
		-4	+212	1.31	21,000	S-ECOPUR	SKF Ecorubber-1	SKF Ecotal ¹⁾
		-58	+212	0.98	21,000	T-ECOPUR	SKF Ecosil	SKF Ecotal ¹⁾
 	Hydraulic, double-acting Profile ring-activated compact PTFE piston seal with integrated back-up rings. Low friction, good chemical and thermal resistance. External guiding elements required.	-22	+212	3.28	5,800	Seal X-ECOPUR	Energizer SKF Ecorubber-1	Back-up rings SKF Ecotal ¹⁾
		-22	+212	3.28	5,800	X-ECOPUR H	SKF Ecorubber-1	SKF Ecotal ¹⁾
		-22	+212	3.94	5,800	X-ECOPUR S	SKF Ecorubber-1	SKF Ecotal ¹⁾
		-22	+212	4.92	5,800	SKF Ecoflon 2,3,4	SKF Ecorubber-1	SKF Ecotal ¹⁾
		-4	+392	4.92	5,800	SKF Ecoflon 2,3,4	SKF Ecorubber-2	SKF Ecopaek
 	Hydraulic, single-acting Chevron ring with flexible lip design. Replacement part for standard commercial housings (male and female adapter mainly made of metal).	-22	+230	1.64	7,200	Seal ECOPUR	Energizer SKF Ecorubber-1	Back-up rings SKF Ecotal ¹⁾
		-31	+230	1.64	7,200	ECOPUR LD	SKF Ecomid	SKF Ecotal ¹⁾
		-22	+230	1.64	7,200	G-ECOPUR	SKF Ecomid	SKF Ecotal ¹⁾
		-4	+230	1.64	7,200	H-ECOPUR	SKF Ecotal ¹⁾	SKF Ecotal ¹⁾
		-4	+230	2.30	7,200	S-ECOPUR	SKF Ecotal ¹⁾	SKF Ecotal ¹⁾
 	Hydraulic, single-acting Chevron sealing set, designed with extremely flexible sealing lips for difficult operating conditions like bad guiding, large tolerance range. Available as total chevron sealing set as well as intermediate chevrons only (in case of metal male and female adapters).	-22	+212	1.64	7,200	Pressure ring SKF Ecotal ¹⁾	Seal ECOPUR	Support ring SKF Ecotal ¹⁾
		-22	+212	1.64	7,200	X-ECOPUR	ECOPUR	SKF Ecotal ¹⁾
		-31	+212	1.64	7,200	SKF Ecomid	ECOPUR LD	SKF Ecomid
		-22	+212	1.64	7,200	G-ECOPUR 54D	G-ECOPUR	SKF Ecomid
		-22	+212	1.64	7,200	SKF Ecomid	G-ECOPUR	SKF Ecomid
 	Hydraulic, double-acting Compact piston seal with almost no dead spots as required for applications in food and pharmaceutical industry. Also commonly used as O-Ring replacement because design with interference fit on outside diameter prevents twisting in dynamic applications.	-22	+230	1.31	5,800	Seal ECOPUR	Energizer SKF Ecorubber-1	Back-up rings SKF Ecotal ¹⁾
		-31	+230	1.31	5,800	ECOPUR LD	SKF Ecorubber-1	SKF Ecotal ¹⁾
		-22	+230	1.31	5,800	G-ECOPUR	SKF Ecorubber-1	SKF Ecotal ¹⁾
		-4	+230	1.31	5,800	H-ECOPUR	SKF Ecorubber-1	SKF Ecotal ¹⁾
		-4	+230	1.64	5,800	S-ECOPUR	SKF Ecorubber-1	SKF Ecotal ¹⁾

¹⁾ SKF Ecotal up to Ø 10.24 inches, SKF Ecomid above Ø 10.24 inches

Rod seals

Linear moving
 Rotating
 Oscillating
 Spiral moving
 Static
 Grey symbols: contact SKF for application limitations

Appli- Profile cation	Description	Temperature		Speed max.	Pressure max.	Material	
		min.	max.				
		°F		ft/s	psi	-	
 	S01-P Hydraulic, single-acting Asymmetric rod seal for standard applications. Interference fit on outside diameter maintains stable fit in the housing. Design provides ultimate sealing effect over a wide temperature range and good backpumping ability. Also used as secondary seal in combination with PTFE seal type S09.	-22	+230	1.64	5,800	ECOPUR	
		-31	+230	1.64	5,800	ECOPUR LD	
		-22	+230	1.64	5,800	G-ECOPUR	
		-4	+230	1.64	5,800	H-ECOPUR	
		-4	+230	2.30	5,800	S-ECOPUR	
-58	+230	1.64	5,800	T-ECOPUR			
 	S01-R Hydraulic, single-acting As profile S01-P, but more easily adaptable for diverse temperatures and media by selection of suitable seal material.	+14	+392	1.64	2,300	Seal	
		-13	+302	1.64	2,300	SKF Ecoflas	
		-22	+212	1.64	2,300	SKF Ecorubber-H	
		-4	+392	1.64	2,300	SKF Ecorubber-1	
		-58	+302	1.64	2,300	SKF Ecorubber-2	
		-76	+392	-	-	SKF Ecorubber-3 ²⁾	
-	-	-	-	SKF Ecosil ³⁾			
 	S02-P Hydraulic, single-acting Asymmetric rod seal for standard applications as S01-P, but thanks to design with active back-up ring, it is suitable for larger extrusion gaps or higher pressure range. S02-P for standard housing design.	-22	+212	1.64	10,000	Seal	Back-up ring
		-31	+212	1.64	10,000	ECOPUR	SKF Ecotal ¹⁾
		-22	+212	1.64	10,000	ECOPUR LD	SKF Ecomid
		-4	+212	1.64	10,000	G-ECOPUR	SKF Ecomid
		-4	+212	2.30	10,000	H-ECOPUR	SKF Ecotal ¹⁾
-40	+212	1.64	10,000	S-ECOPUR	SKF Ecotal ¹⁾		
-	-	-	-	T-ECOPUR	SKF Ecotal ¹⁾		
 	S02-PD Hydraulic, single-acting Asymmetric rod seal for standard applications as S01-P, but thanks to design with active back-up ring, it is suitable for larger extrusion gaps or higher pressure range. S02-PD for small housing design.	-22	+212	1.64	10,000	Seal	Back-up ring
		-31	+212	1.64	10,000	ECOPUR	SKF Ecotal ¹⁾
		-22	+212	1.64	10,000	ECOPUR LD	SKF Ecomid
		-4	+212	1.64	10,000	G-ECOPUR	SKF Ecomid
		-4	+212	2.30	10,000	H-ECOPUR	SKF Ecotal ¹⁾
		-40	+212	1.64	10,000	S-ECOPUR	SKF Ecotal ¹⁾
-	-	-	-	T-ECOPUR	SKF Ecotal ¹⁾		
 	S02-R Hydraulic, single-acting as profile S02-P, but more adaptation possibilities for diverse temperatures and media by selection of suitable seal material. S02-R for standard housing design.	+14	+392	1.64	3,600	Seal	Back-up ring
		-13	+302	1.64	3,600	SKF Ecoflas	SKF Ecopaek
		-13	+212	1.64	3,600	SKF Ecorubber-H	SKF Ecoflon 2
		-22	+212	1.64	3,600	SKF Ecorubber-1	SKF Ecotal ¹⁾
		-4	+392	1.64	3,600	SKF Ecorubber-2	SKF Ecotal ¹⁾
		-58	+302	1.64	3,600	SKF Ecorubber-3 ²⁾	SKF Ecoflon 2
-40	+212	1.64	3,600	SKF Ecorubber-3 ²⁾	SKF Ecotal ¹⁾		
 	S02-RD Hydraulic, single-acting As profile S02-P, but more easily adaptable for diverse temperatures and media by selection of suitable seal material. S02-RD for small housing design.	+14	+392	1.64	3,600	Seal	Back-up ring
		-13	+302	1.64	3,600	SKF Ecoflas	SKF Ecopaek
		-13	+212	1.64	3,600	SKF Ecorubber-H	SKF Ecoflon 2
		-22	+212	1.64	3,600	SKF Ecorubber-1	SKF Ecotal ¹⁾
		-4	+392	1.64	3,600	SKF Ecorubber-2	SKF Ecoflon 2
		-58	+302	1.64	3,600	SKF Ecorubber-3 ²⁾	SKF Ecoflon 2
-40	+212	1.64	3,600	SKF Ecorubber-3 ²⁾	SKF Ecotal ¹⁾		

¹⁾ SKF Ecotal up to Ø 10.24 inches, SKF Ecomid above Ø 10.24 inches
²⁾ Not suitable for mineral oils
³⁾ Only recommended for static or quasi-static applications. Contact SKF for more information

Rod seals

Linear moving
 Rotating
 Oscillating
 Spiral moving
 Static
 Grey symbols: contact SKF for application limitations

Appli- Profile cation	Description	Temperature		Speed max.	Pressure max.	Material		
		min.	max.			Seal	Back-up ring	
		°F		ft/s	psi	-	-	
 	S02-S Hydraulic, single-acting Asymmetric rod seal, for special housings (DIN/ISO 7425 part 2) and for the use as a primary rod seal in sealing systems, thanks to design with active back-up ring, it is suitable for high pressure peaks or larger extrusion gaps.	-22	+212	16.40	5,800	Seal	Back-up ring	
		-4	+212	16.40	5,800	ECOPUR	SKF Ecotal ¹⁾	
		-4	+212	22.97	5,800	H-ECOPUR	SKF Ecotal ¹⁾	
		-4	+212	16.40	5,800	S-ECOPUR	SKF Ecotal ¹⁾	
		-40	+212	16.40	5,800	T-ECOPUR	SKF Ecotal ¹⁾	
 	S03-P Hydraulic, single-acting O-Ring activated, asymmetrical rod seal. Interference fit on outside diameter maintains stable fit in the housing. Design provides ultimate sealing effect. Especially suitable for short stroke applications (e.g. spindle seals, coupling actuators...)	-22	+212	1.64	5,800	Seal	O-ring	
		-31	+230	1.64	5,800	ECOPUR	NBR 70	
		-22	+212	1.64	5,800	ECOPUR LD	NBR 70	
		-4	+212	1.64	5,800	G-ECOPUR	NBR 70	
		-4	+212	2.30	5,800	H-ECOPUR	NBR 70	
		-58	+230	1.64	5,800	S-ECOPUR	NBR 70	
-	-	-	-	T-ECOPUR	MVQ 70			
 	S03-F PTFE rod seal, single-acting O-Ring activated, asymmetrical PTFE rod seal, low friction, good dry running properties and adaptation possibilities for diverse temperatures and media by selection of suitable O-Ring material. Almost no dead spots as required for applications in food and pharma industry.	-67	+392	3.28	2,900	Seal	O-ring	
		-22	+212	3.28	2,900	SKF Ecoflon 1	MVQ 70	
		-58	+302	3.28	5,800	SKF Ecoflon 1	NBR 70	
		-4	+392	3.28	5,800	SKF Ecoflon 2,3,4	EPDM	
		-67	+392	3.28	5,800	SKF Ecoflon 2,3,4	FPM 75	
		-22	+212	3.28	5,800	SKF Ecoflon 2,3,4	MVQ 70	
-67	+194	1.64	2,900	SKF Ecoflon 2,3,4	NBR 70			
-22	+194	1.64	2,900	SKF Ecowear 1000	NBR 70			
-	-	-	-	SKF Ecowear 1000	NBR 70			
 	S03-S PTFE rod seal, single-acting Helicoil spring activated, asymmetrical PTFE rod seal, low friction and good dry running properties, excellent chemical and thermal resistance. Mainly used in chemical, pharma and food industry.	-328	+500	3.28	2,900	Seal	Spring	
		-328	+500	3.28	5,800	SKF Ecoflon 1	1.4310	
		-328	+194	1.64	2,900	SKF Ecoflon 2,3,4	1.4310	
		-	-	-	-	SKF Ecowear 1000	1.4310	
 	S04-P Hydraulic, single-acting Asymmetric rod seal for standard applications as S03-P, but thanks to design with active back-up ring, it is suitable for larger extrusion gaps or higher pressure range. S04-P for standard housing design.	-22	+212	1.64	10,000	Seal	O-ring	Back-up
		-22	+212	1.64	10,000	ECOPUR	NBR 70	SKF Ecotal ¹⁾
		-22	+212	1.64	10,000	ECOPUR LD	NBR 70	SKF Ecomid
		-4	+212	1.64	10,000	G-ECOPUR	NBR 70	SKF Ecomid
		-4	+212	2.30	10,000	H-ECOPUR	NBR 70	SKF Ecotal ¹⁾
		-40	+212	1.64	10,000	S-ECOPUR	NBR 70	SKF Ecotal ¹⁾
-	-	-	-	T-ECOPUR	MVQ 70	SKF Ecotal ¹⁾		
 	S04-PD Hydraulic, single-acting Asymmetric rod seal for standard applications as S03-P, but thanks to design with active back-up ring, it is suitable for larger extrusion gaps or higher pressure range. S04-PD for small housing design.	-22	+212	1.64	10,000	Seal	O-ring	Back-up
		-22	+212	1.64	10,000	ECOPUR	NBR 70	SKF Ecotal ¹⁾
		-22	+212	1.64	10,000	ECOPUR LD	NBR 70	SKF Ecomid
		-4	+212	1.64	10,000	G-ECOPUR	NBR 70	SKF Ecomid
		-4	+212	2.30	10,000	H-ECOPUR	NBR 70	SKF Ecotal ¹⁾
		-40	+212	1.64	10,000	S-ECOPUR	NBR 70	SKF Ecotal ¹⁾
-	-	-	-	T-ECOPUR	MVQ 70	SKF Ecotal ¹⁾		

¹⁾ SKF Ecotal up to Ø 10.24 inches, SKF Ecomid above Ø 10.24 inches

Rod seals

Linear moving
 Rotating
 Oscillating
 Spiral moving
 Static
 Grey symbols: contact SKF for application limitations

Appli- Profile cation	Description	Temperature		Speed max.	Pressure max.	Material		
		min.	max.			–	–	
		°F		ft/s	psi			
 S09-ES 	Hydraulic, single-acting Profile ring-activated asymmetric PTFE rod seal, similar to S09-E, but special heavy duty design for heavy industry hydraulics or for special housing dimensions.	-22	+212	16.40	8,700	Glide ring G-ECOPUR 54D G-ECOPUR 54D X-ECOPUR, H, S X-ECOPUR, H, S SKF Ecoflon 2,3,4 SKF Ecoflon 2,3,4 SKF Ecowear 1000 SKF Ecowear 1000	Energizer SKF Ecorubber-1 SKF Ecosil SKF Ecorubber-1 SKF Ecosil SKF Ecorubber-1 SKF Ecorubber-2 SKF Ecorubber-1 SKF Ecosil	
		-76	+230	16.40	8,700			
		-22	+212	16.40	8,700			
		-76	+230	16.40	8,700			
		-22	+212	32.81	8,700			
		-4	+392	32.81	8,700			
		-22	+194	16.40	5,800			
-76	+194	16.40	5,800					
 S09-DS 	Hydraulic, double-acting Profile ring-activated symmetric PTFE rod seal, similar to S09-D, but special heavy duty design for heavy industry hydraulics or for special housing dimensions.	-22	+212	16.40	8,700	Glide ring G-ECOPUR 54D G-ECOPUR 54D X-ECOPUR, H, S X-ECOPUR, H, S SKF Ecoflon 2,3,4 SKF Ecoflon 2,3,4 SKF Ecowear 1000 SKF Ecowear 1000	Energizer SKF Ecorubber-1 SKF Ecosil SKF Ecorubber-1 SKF Ecosil SKF Ecorubber-1 SKF Ecorubber-2 SKF Ecorubber-1 SKF Ecosil	
		-76	+230	16.40	8,700			
		-22	+212	16.40	8,700			
		-76	+230	16.40	8,700			
		-22	+212	32.81	8,700			
		-4	+392	32.81	8,700			
		-22	+194	16.40	5,800			
-76	+194	16.40	5,800					
 S1012-M 	Hydraulic, single-acting Chevron sealing set, parting surface design. For heavy industry hydraulics.	-22	+212	1.64	7,200	S10-A SKF Ecotal ¹⁾ SKF Ecomid SKF Ecomid SKF Ecotal ¹⁾ SKF Ecotal ¹⁾ SKF Ecoflon 2 SKF Ecoflon 2 SKF Ecoflon 2 SKF Ecoflon 2	S11-M ECOPUR ECOPUR LD G-ECOPUR H-ECOPUR S-ECOPUR SKF Ecorubber-H SKF Ecorubber-1 SKF Ecorubber-2 SKF Ecorubber-3	S12-M X-ECOPUR ³⁾ SKF Ecomid G-ECOPUR 54D ⁴⁾ X-ECOPUR H ³⁾ X-ECOPUR S ³⁾ SKF Ecoflon 2 SKF Ecoflon 2 SKF Ecoflon 2 SKF Ecoflon 2
		-31	+212	1.64	7,200			
		-22	+212	2.30	7,200			
		-4	+212	1.64	7,200			
		-4	+212	1.64	7,200			
		-13	+302	1.64	3,600			
		-22	+212	1.64	3,600			
-4	+392	1.64	3,600					
-58	+302	1.64	3,600					
 S1012-T 	Hydraulic, single-acting Chevron sealing set, machined surface design. For heavy industry hydraulics.	-22	+212	1.64	7,200	S10-A SKF Ecotal ¹⁾ SKF Ecomid SKF Ecotal ¹⁾ SKF Ecotal ¹⁾ SKF Ecotal ¹⁾ SKF Ecoflon 2 SKF Ecoflon 2 SKF Ecoflon 2 SKF Ecoflon 2	S11-T ECOPUR ECOPUR LD G-ECOPUR H-ECOPUR S-ECOPUR SKF Ecorubber-H SKF Ecorubber-1 SKF Ecorubber-2 SKF Ecorubber-3	S12-T X-ECOPUR ³⁾ SKF Ecomid G-ECOPUR 54D ⁴⁾ X-ECOPUR H ³⁾ X-ECOPUR S ³⁾ SKF Ecoflon 2 SKF Ecoflon 2 SKF Ecoflon 2 SKF Ecoflon 2
		-31	+212	1.64	7,200			
		-22	+212	2.30	7,200			
		-4	+212	1.64	7,200			
		-4	+212	1.64	7,200			
		-13	+302	1.64	3,600			
		-22	+212	1.64	3,600			
-4	+392	1.64	3,600					
-58	+302	1.64	3,600					
 S1315-T 	Hydraulic, single-acting Chevron sealing set, design with flexible sealing lips, good sealing ability in higher pressure range. For heavy industry hydraulics, water-hydraulic systems.	-22	+212	1.64	8,700	S13-A SKF Ecotal ¹⁾ SKF Ecotal ¹⁾ SKF Ecomid SKF Ecomid SKF Ecotal ¹⁾ SKF Ecotal ¹⁾ SKF Ecotal ¹⁾ SKF Ecotal ¹⁾ SKF Ecotal ¹⁾	S14-A ECOPUR ECOPUR ECOPUR LD G-ECOPUR H-ECOPUR H-ECOPUR S-ECOPUR S-ECOPUR T-ECOPUR	S15-A X-ECOPUR SKF Ecotal ¹⁾ SKF Ecomid SKF Ecomid X-ECOPUR H SKF Ecotal ¹⁾ X-ECOPUR S SKF Ecotal ¹⁾ SKF Ecotal ¹⁾
		-22	+212	1.64	8,700			
		-31	+212	1.64	8,700			
		-22	+212	1.64	8,700			
		-4	+212	1.64	8,700			
		-4	+212	1.64	8,700			
		-4	+212	2.30	8,700			
-40	+212	1.64	8,700					
 S16-A 	Hydraulic/pneumatic, single-acting Simple hat seal, usually fixed in housing with clamp flange. Mainly used for replacement in old hydraulic and pneumatic cylinders or for secondary applications.	-22	+230	1.64	2,300	ECOPUR ECOPUR LD G-ECOPUR H-ECOPUR S-ECOPUR T-ECOPUR SKF Ecoflas SKF Ecorubber-H SKF Ecorubber-1 SKF Ecorubber-2 SKF Ecorubber-3 ²⁾		
		-31	+230	1.64	2,300			
		-22	+230	1.64	2,300			
		-4	+230	1.64	2,300			
		-4	+230	2.30	2,300			
		-58	+230	1.64	2,300			
		+14	+392	1.64	2,300			
		-13	+302	1.64	2,300			
		-22	+212	1.64	2,300			
		-4	+392	1.64	2,300			
-58	+302	1.64	2,300					

¹⁾ SKF Ecotal up to Ø 10.24 inches, SKF Ecomid above Ø 10.24 inches
²⁾ Not suitable for mineral oils
³⁾ Alternative SKF Ecotal up to Ø 10.24 inches, SKF Ecomid above Ø 10.24 inches
⁴⁾ Alternative SKF Ecomid

Rod seals

Linear moving
 Rotating
 Oscillating
 Spiral moving
 Static
 Grey symbols: contact SKF for application limitations

Appli- Profile cation	Description	Temperature		Speed max.	Pressure max.	Material	
		min.	max.			–	–
		°F		ft/s	psi		
 S16-B 	Hydraulic/pneumatic, single-acting Simple hat seal, usually fixed in housing with clamp flange. Mainly used for replacement in old hydraulic and pneumatic cylinders or for secondary applications.	-22	+230	1.64	2,300	ECOPUR ECOPUR LD G-ECOPUR H-ECOPUR S-ECOPUR T-ECOPUR SKF Ecoflas SKF Ecorubber-H SKF Ecorubber-1 SKF Ecorubber-2 SKF Ecorubber-3 ²⁾	
		-31	+230	1.64	2,300		
		-22	+230	1.64	2,300		
		-4	+230	1.64	2,300		
		-4	+230	2.30	2,300		
		-58	+230	1.64	2,300		
		+14	+392	1.64	2,300		
		-13	+302	1.64	2,300		
		-22	+212	1.64	2,300		
		-4	+392	1.64	2,300		
-58	+302	1.64	2,300				
 S17-P 	Hydraulic, single-acting Asymmetric rod seal with additional stabilizing lip. Interference fit on outside diameter maintains stable fit in the housing. Design mainly used for telescopic cylinders, mobile hydraulic or for special housing dimensions.	-22	+230	1.64	5,800	ECOPUR ECOPUR LD G-ECOPUR H-ECOPUR S-ECOPUR T-ECOPUR	
		-31	+230	1.64	5,800		
		-22	+230	1.64	5,800		
		-4	+230	1.64	5,800		
		-4	+230	2.30	5,800		
		-58	+230	1.64	5,800		
		-58	+230	1.64	5,800		
 S17-R 	Hydraulic, single-acting As profile S17-P, but easily adaptable for diverse temperatures and media by selection of suitable seal material.	+14	+392	1.64	2,300	SKF Ecoflas SKF Ecorubber-H SKF Ecorubber-1 SKF Ecorubber-2 SKF Ecorubber-3 ²⁾	
		-13	+302	1.64	2,300		
		-22	+212	1.64	2,300		
		-4	+392	1.64	2,300		
		-58	+302	1.64	2,300		
 S18-P 	Hydraulic, single-acting Asymmetric rod seal as S17-P, but thanks to design with active back-up ring, it is suitable for larger extrusion gaps or higher pressure range.	-22	+212	1.64	8,700	Seal ECOPUR ECOPUR LD G-ECOPUR H-ECOPUR S-ECOPUR T-ECOPUR	Back-up ring SKF Ecotal ¹⁾ SKF Ecomid SKF Ecotal ¹⁾ SKF Ecotal ¹⁾ SKF Ecotal ¹⁾
		-31	+212	1.64	8,700		
		-22	+212	1.64	8,700		
		-4	+212	1.64	8,700		
		-4	+212	2.30	8,700		
		-40	+212	1.64	8,700		
 S18-R 	Hydraulic, single-acting Asymmetric rod seal with additional sealing—respectively stabilizing lip and back ring. Easily adaptable for diverse temperatures and media by selection of suitable seal material, thanks to design with active back-up ring, it is suitable for larger extrusion gaps or higher pressure range.	+14	+392	1.64	3,600	Seal SKF Ecoflas SKF Ecorubber-H SKF Ecorubber-H SKF Ecorubber-1 SKF Ecorubber-2 SKF Ecorubber-3 SKF Ecorubber-3	Back-up ring SKF Ecoflon 2 SKF Ecoflon 2 SKF Ecotal ¹⁾ SKF Ecotal ¹⁾ SKF Ecoflon 2 SKF Ecoflon 2 SKF Ecotal ¹⁾
		-13	+302	1.64	3,600		
		-13	+212	1.64	3,600		
		-22	+212	1.64	3,600		
		-4	+392	1.64	3,600		
		-58	+302	1.64	3,600		
-40	+212	1.64	3,600				
 S19-F 	PTFE rod seal, single-acting Finger spring activated, asymmetrical PTFE rod seal, low friction and good dry running properties, excellent chemical and thermal resistance, mainly used in chemical, pharma and food industry.	-328	+500	49.21	2,900	Seal SKF Ecoflon 1 SKF Ecoflon 2 SKF Ecoflon 3 SKF Ecoflon 4 SKF ECOWAER 1000	Spring 1.4310 ³⁾ 1.4310 ³⁾ 1.4310 ³⁾ 1.4310 ³⁾ 1.4310 ³⁾
		-328	+500	49.21	5,800		
		-328	+500	49.21	5,800		
		-328	+500	49.21	5,800		
		-328	+194	49.21	2,900		
		-328	+194	49.21	2,900		

¹⁾ SKF Ecotal up to Ø 10.24 inches, SKF Ecomid above Ø 10.24 inches
²⁾ Not suitable for mineral oils
³⁾ Spring metal material specification

Rod seals

Linear moving
 Rotating
 Oscillating
 Spiral moving
 Static
 Grey symbols: contact SKF for application limitations

Appli- Profile cation	Description	Temperature		Speed max.	Pressure max.	Material		
		min.	max.			–	–	
		°F		ft/s	psi			
 	S20-R Hydraulic, double-acting Space saving, compact rod seal, fits standard O-Ring housings. Advantage compared to O-Ring: integrated active back-up rings for high pressure, designed with interference fit on outside diameter prevents twisting in dynamic applications.	-13	+302	1.64	10,000	Seal SKF Ecorubber-H	Back-up ring SKF Ecoflon 2	
		-13	+302	1.64	10,000	SKF Ecorubber-H	SKF Ecopaek	
		-13	+212	1.64	10,000	SKF Ecorubber-H	SKF Ecotal ¹⁾	
		-22	+212	1.64	10,000	SKF Ecorubber-1	SKF Ecotal ¹⁾	
		-4	+392	1.64	10,000	SKF Ecorubber-2	SKF Ecoflon 2	
-4	+392	1.64	10,000	SKF Ecorubber-2	SKF Ecopaek			
 	S21-P Hydraulic, single-acting O-Ring activated symmetric rod seal with sharp-edged sealing lips, good sealing effect for high viscosity fluids, not recommended for new designs (profile S03-P preferred).	-22	+212	1.64	5,800	Seal ECOPUR	O-ring NBR 70	
		-4	+212	1.64	5,800	H-ECOPUR	NBR 70	
		-4	+212	2.30	5,800	S-ECOPUR	NBR 70	
		-58	+230	1.64	5,800	T-ECOPUR	MVQ 70	
 	S22-P Hydraulic, single-acting Symmetric rod seal with support ring for simple applications to serve repair purpose, not recommended for new designs (profile S01-P preferred). Retainer ring can be designed straight or as an angled ring.	-22	+212	1.64	5,800	Seal ECOPUR	Support ring SKF Ecotal ¹⁾	
		-31	+212	1.64	5,800	ECOPUR LD	SKF Ecomid	
		-22	+212	1.64	5,800	G-ECOPUR	SKF Ecomid	
		-4	+212	1.64	5,800	H-ECOPUR	SKF Ecotal ¹⁾	
		-4	+212	2.30	5,800	S-ECOPUR	SKF Ecotal ¹⁾	
-40	+212	1.64	5,800	T-ECOPUR	SKF Ecotal ¹⁾			
 	S22-R Hydraulic, single-acting Symmetric rod seal as S22-P, but more adaptation possibilities for diverse temperatures and media by selection of suitable seal material. Retainer ring can be designed straight or as an angled ring.	+14	+392	1.64	2,300	Seal SKF Ecoflas	Support ring SKF Ecoflon 2	
		-13	+302	1.64	2,300	SKF Ecorubber-H	SKF Ecoflon 2	
		-13	+212	1.64	2,300	SKF Ecorubber-H	SKF Ecotal ¹⁾	
		-22	+212	1.64	2,300	SKF Ecorubber-1	SKF Ecotal ¹⁾	
		-4	+392	1.64	2,300	SKF Ecorubber-2	SKF Ecoflon 2	
		-58	+302	1.64	2,300	SKF Ecorubber-3 ²⁾	SKF Ecoflon 2	
		-40	+212	1.64	2,300	SKF Ecorubber-3 ²⁾	SKF Ecotal ¹⁾	
 	S24-P Hydraulic, single-acting O-Ring activated rod seal with additional stabilizing lips and integrated active back ring for larger extrusion gaps, mainly used in mining industry.	-22	+212	1.64	10,000	Seal ECOPUR	O-ring NBR 70	Back-up ring SKF Ecotal ¹⁾
		-4	+212	1.64	10,000	H-ECOPUR	NBR 70	SKF Ecotal ¹⁾
		-4	+212	2.30	10,000	S-ECOPUR	NBR 70	SKF Ecotal ¹⁾
		-40	+212	1.64	10,000	T-ECOPUR	MVQ 70	SKF Ecotal ¹⁾
 	S2527-F PTFE chevron set, single-acting Optimized for low pressure, unequal angled chevron design results in good contact pressure even in low pressure range. External spring pretension necessary. Mainly used in chemical, pharmaceutical and food industry.	-328	+500	4.92	1,450	S25-F SKF Ecoflon 2	S26-F SKF Ecoflon 1	S27-F SKF Ecoflon 2

¹⁾ SKF Ecotal up to Ø 10.24 inches, SKF Ecomid above Ø 10.24 inches
²⁾ Not suitable for mineral oils

Rod seals

Linear moving
 Rotating
 Oscillating
 Spiral moving
 Static
 Grey symbols: contact SKF for application limitations

Appli- Profile cation	Description	Temperature		Speed max.	Pressure max.	Material			
		min.	max.			–	–	–	
		°F		ft/s	psi				
 	S2931-F PTFE chevron set, single-acting Optimized for high pressure, equal angled chevron design suitable for high pressure range. External spring pretension necessary. Mainly used in chemical, pharmaceutical and food industry.	-328	+500	4.92	4,500	S29-F SKF Ecoflon 2	S30-F SKF Ecoflon 1	S31-F SKF Ecoflon 2	
 	S32-P Hydraulic, single-acting Chevron set, design with extremely flexible sealing lips for difficult operating conditions (bad guiding, large tolerance range). Available as total chevron set as well as intermediate chevrons only (in case of metal male and female adaptors).	-22	+212	1.64	7,200	Pressure ring SKF Ecotal ¹⁾	Seal ECOPUR	Support ring SKF Ecotal ¹⁾	
		-22	+212	1.64	7,200	X-ECOPUR	ECOPUR	SKF Ecotal ¹⁾	
		-31	+212	1.64	7,200	SKF Ecomid	ECOPUR LD	SKF Ecomid	
		-22	+212	1.64	7,200	G-ECOPUR 54D	G-ECOPUR	SKF Ecomid	
		-22	+212	1.64	7,200	SKF Ecomid	G-ECOPUR	SKF Ecomid	
		-4	+212	1.64	7,200	X-ECOPUR H	H-ECOPUR	SKF Ecotal ¹⁾	
		-4	+212	1.64	7,200	SKF Ecotal ¹⁾	H-ECOPUR	SKF Ecotal ¹⁾	
		-4	+212	2.30	7,200	SKF Ecotal ¹⁾	S-ECOPUR	SKF Ecotal ¹⁾	
		-4	+212	2.30	7,200	X-ECOPUR S	S-ECOPUR	SKF Ecotal ¹⁾	
		-40	+212	1.64	7,200	SKF Ecotal ¹⁾	T-ECOPUR	SKF Ecotal ¹⁾	
 	S35-P Hydraulic, double-acting Compact rod seal with almost no dead spots as required for applications in food and pharmaceutical industry. Also commonly used as O-Ring replacement because design with interference fit on outside diameter prevents twisting in dynamic applications.	-22	+230	1.31	5,800	ECOPUR			
		-31	+230	1.31	5,800	ECOPUR LD			
		-22	+230	1.31	5,800	G-ECOPUR			
		-4	+230	1.31	5,800	H-ECOPUR			
		-4	+230	1.64	5,800	S-ECOPUR			
-58	+230	1.31	5,800	T-ECOPUR					

¹⁾ SKF Ecotal up to Ø 10.24 inches, SKF Ecomid above Ø 10.24 inches



Appli- Profile cation	Description	Temperature		Speed max.	Material
		min.	max.		
		°F		ft/s	-
 	Hydraulic, single-acting Wiper with interference fit on outside diameter, providing a technically accurate closure at the cylinder. Wiping edge provides reliable protection against penetration of dust and dirt whilst allowing backflow of residual oil film. Back support area prevents tilting of wiper. For housings compliant with ISO 6195–Type A.	-22	+230	13.12	ECOPUR
		-31	+230	13.12	ECOPUR LD
		-22	+230	13.12	G-ECOPUR
		-22	+230	13.12	G-ECOPUR 54D ²⁾
		-4	+230	13.12	H-ECOPUR
		-4	+230	13.12	S-ECOPUR
		-58	+230	13.12	T-ECOPUR
		-22	+230	13.12	X-ECOPUR ²⁾
		-4	+230	13.12	X-ECOPUR H ²⁾
		-4	+230	13.12	X-ECOPUR S ²⁾
		+14	+392	13.12	SKF Ecoflas
		-13	+302	13.12	SKF Ecorubber-H
		-22	+212	13.12	SKF Ecorubber-1
		-4	+392	13.12	SKF Ecorubber-2
-58	+302	13.12	SKF Ecorubber-3 ¹⁾		
 	Hydraulic, single-acting As profile A01–A, but without back support area. For housings according ISO 6195–Type A.	-22	+230	13.12	ECOPUR
		-31	+230	13.12	ECOPUR LD
		-22	+230	13.12	G-ECOPUR
		-22	+230	13.12	G-ECOPUR 54D ²⁾
		-4	+230	13.12	H-ECOPUR
		-4	+230	13.12	S-ECOPUR
		-58	+230	13.12	T-ECOPUR
		-22	+230	13.12	X-ECOPUR ²⁾
		-4	+230	13.12	X-ECOPUR H ²⁾
		-4	+230	13.12	X-ECOPUR S ²⁾
		+14	+392	13.12	SKF Ecoflas
		-13	+302	13.12	SKF Ecorubber-H
		-22	+212	13.12	SKF Ecorubber-1
		-4	+392	13.12	SKF Ecorubber-2
-58	+302	13.12	SKF Ecorubber-3 ¹⁾		
 	Hydraulic, single-acting Wiper with interference fit on outside diameter. Wiping edge provides a reliable protection against penetration of dust and dirt whilst allowing backflow of residual oil film. Back support area prevents tilting of wiper.	-22	+230	13.12	ECOPUR
		-31	+230	13.12	ECOPUR LD
		-22	+230	13.12	G-ECOPUR
		-22	+230	13.12	G-ECOPUR 54D ²⁾
		-4	+230	13.12	H-ECOPUR
		-4	+230	13.12	S-ECOPUR
		-58	+230	13.12	T-ECOPUR
		-22	+230	13.12	X-ECOPUR ²⁾
		-4	+230	13.12	X-ECOPUR H ²⁾
		-4	+230	13.12	X-ECOPUR S ²⁾
		+14	+392	13.12	SKF Ecoflas
		-13	+302	13.12	SKF Ecorubber-H
		-22	+212	13.12	SKF Ecorubber-1
		-4	+392	13.12	SKF Ecorubber-2
-58	+302	13.12	SKF Ecorubber-3 ¹⁾		
 	Hydraulic, single-acting Wiper with interference fit on outside diameter. Wiping edge provides a reliable protection against penetration of dust and dirt whilst allowing backflow of residual oil film.	-22	+230	13.12	ECOPUR
		-31	+230	13.12	ECOPUR LD
		-22	+230	13.12	G-ECOPUR
		-22	+230	13.12	G-ECOPUR 54D ²⁾
		-4	+230	13.12	H-ECOPUR
		-4	+230	13.12	S-ECOPUR
		-58	+230	13.12	T-ECOPUR
		-22	+230	13.12	X-ECOPUR ²⁾
		-4	+230	13.12	X-ECOPUR H ²⁾
		-4	+230	13.12	X-ECOPUR S ²⁾
		+14	+392	13.12	SKF Ecoflas
		-13	+302	13.12	SKF Ecorubber-H
		-22	+212	13.12	SKF Ecorubber-1
		-4	+392	13.12	SKF Ecorubber-2
-58	+302	13.12	SKF Ecorubber-3 ¹⁾		

¹⁾ Not suitable for mineral oils
²⁾ For hard grade polyurethanes, refer to material properties on page 12

Appli- Profile cation	Description	Temperature		Speed max.	Material			
		min.	max.					
		°F		ft/s	-			
 	Hydraulic, single-acting As profile A02–A, but without back support area. Special housing design according ISO 6195–Type C.	-22	+230	13.12	ECOPUR			
		-4	+230	13.12	H-ECOPUR			
		-4	+230	13.12	S-ECOPUR			
		-58	+230	13.12	T-ECOPUR			
		-22	+230	13.12	X-ECOPUR ³⁾			
		-4	+230	13.12	X-ECOPUR H ²⁾			
		-4	+230	13.12	X-ECOPUR S ³⁾			
		+14	+392	13.12	SKF Ecoflas			
		-13	+302	13.12	SKF Ecorubber-H			
		-22	+212	13.12	SKF Ecorubber-1			
		-4	+392	13.12	SKF Ecorubber-2			
		-58	+302	13.12	SKF Ecorubber-3 ²⁾			
		 	Hydraulic, single-acting Wiper with mounting cage for press–fit installation into axially open housings. Wiping edge provides a reliable protection against penetration of dust and dirt, the use of plastic mounting cages avoids corrosion in the press–fit. For housings according ISO 6195–Type B.	-22	+176	13.12	Seal ECOPUR	Housing SKF Ecotal ¹⁾
				-4	+176	13.12	H-ECOPUR	
-4	+176			16.40	S-ECOPUR	SKF Ecotal ¹⁾		
-40	+176			13.12	T-ECOPUR	SKF Ecotal ¹⁾		
-22	+176			13.12	X-ECOPUR ³⁾	SKF Ecotal ¹⁾		
-4	+176			13.12	X-ECOPUR H ³⁾	SKF Ecotal ¹⁾		
-4	+176			16.40	X-ECOPUR S ³⁾	SKF Ecotal ¹⁾		
+14	+392			13.12	SKF Ecoflas	SKF Ecopaek		
-13	+176			13.12	SKF Ecorubber-H	SKF Ecotal ¹⁾		
-22	+176			13.12	SKF Ecorubber-1	SKF Ecotal ¹⁾		
-4	+392			13.12	SKF Ecorubber-2	SKF Ecopaek		
-58	+302			13.12	SKF Ecorubber-3 ²⁾	SKF Ecopaek		
 	Pneumatic, single-acting Wiper with interference fit on outside diameter, providing a technically accurate closure at the cylinder. Special design of wiping lip allows retention of initial lubricating film. Back support area prevents tilting of wiper. For housings according ISO 6195–Type A.			-22	+230	13.12	ECOPUR	
				-31	+230	13.12	ECOPUR LD	
		-22	+230	13.12	G-ECOPUR			
		-22	+230	13.12	G-ECOPUR 54D ³⁾			
		-4	+230	13.12	H-ECOPUR			
		-4	+230	13.12	S-ECOPUR			
		-58	+230	13.12	T-ECOPUR			
		-22	+230	13.12	X-ECOPUR ³⁾			
		-4	+230	13.12	X-ECOPUR H ³⁾			
		-4	+230	13.12	X-ECOPUR S ³⁾			
		+14	+392	13.12	SKF Ecoflas			
		-13	+302	13.12	SKF Ecorubber-H			
		-22	+212	13.12	SKF Ecorubber-1			
		-4	+392	13.12	SKF Ecorubber-2			
-58	+302	13.12	SKF Ecorubber-3 ²⁾					
 	Pneumatic, single-acting As profile A04–A, but without back support area. For housings according ISO 6195–Type A.	-22	+230	13.12	ECOPUR			
		-31	+230	13.12	ECOPUR LD			
		-22	+230	13.12	G-ECOPUR			
		-22	+230	13.12	G-ECOPUR 54D ³⁾			
		-4	+230	13.12	H-ECOPUR			
		-4	+230	13.12	S-ECOPUR			
		-58	+230	13.12	T-ECOPUR			
		-22	+230	13.12	X-ECOPUR ³⁾			
		-4	+230	13.12	X-ECOPUR H ³⁾			
		-4	+230	13.12	X-ECOPUR S ³⁾			
		+14	+392	13.12	SKF Ecoflas			
		-13	+302	13.12	SKF Ecorubber-H			
		-22	+212	13.12	SKF Ecorubber-1			
		-4	+392	13.12	SKF Ecorubber-2			
-58	+302	13.12	SKF Ecorubber-3 ²⁾					

¹⁾ SKF Ecotal up to Ø 10.24 inches, SKF Ecomid above Ø 10.24 inches
²⁾ Not suitable for mineral oils
³⁾ For hard grade polyurethanes, refer to material properties on page 12

Appli- Profile cation	Description	Temperature		Speed max.	Material				
		min.	max.						
		°F		ft/s	-				
 	Pneumatic, single-acting Wiper with interference fit on outside diameter. Special design of wiping lip allows retention of initial lubricating film. Back support area prevents tilting of wiper.	-22	+230	13.12	ECOPUR				
		-31	+230	13.12	ECOPUR LD				
		-22	+230	13.12	G-ECOPUR				
		-22	+230	13.12	G-ECOPUR 54D ³⁾				
		-4	+230	13.12	H-ECOPUR				
		-4	+230	13.12	S-ECOPUR				
		-58	+230	13.12	T-ECOPUR				
		-22	+230	13.12	X-ECOPUR ³⁾				
		-4	+230	13.12	X-ECOPUR H ³⁾				
		-4	+230	13.12	X-ECOPUR S ³⁾				
		+14	+392	13.12	SKF Ecoflas				
		-13	+302	13.12	SKF Ecorubber-H				
		-22	+212	13.12	SKF Ecorubber-1				
		-4	+392	13.12	SKF Ecorubber-2				
-58	+302	13.12	SKF Ecorubber-3 ²⁾						
 	Pneumatic, single-acting Wiper with interference fit on outside diameter. Special design of wiping lip allows retention of initial lubricating film.	-22	+230	13.12	ECOPUR				
		-4	+230	13.12	H-ECOPUR				
		-4	+230	13.12	S-ECOPUR				
		-58	+230	13.12	T-ECOPUR				
		-22	+230	13.12	X-ECOPUR ³⁾				
		-4	+230	13.12	X-ECOPUR H ³⁾				
		-4	+230	13.12	X-ECOPUR S ³⁾				
		+14	+392	13.12	SKF Ecoflas				
		-13	+302	13.12	SKF Ecorubber-H				
		-22	+212	13.12	SKF Ecorubber-1				
		-4	+392	13.12	SKF Ecorubber-2				
		-58	+302	13.12	SKF Ecorubber-3 ²⁾				
		 	Pneumatic, single-acting As profile A05-A, but without back support area. Special housing design according ISO 6195-Type C.	-22	+230	13.12	ECOPUR		
				-4	+230	13.12	H-ECOPUR		
-4	+230			13.12	S-ECOPUR				
-58	+230			13.12	T-ECOPUR				
-22	+230			13.12	X-ECOPUR ³⁾				
-4	+230			13.12	X-ECOPUR H ³⁾				
-4	+230			13.12	X-ECOPUR S ³⁾				
+14	+392			13.12	SKF Ecoflas				
-13	+302			13.12	SKF Ecorubber-H				
-22	+212			13.12	SKF Ecorubber-1				
-4	+392			13.12	SKF Ecorubber-2				
-58	+302			13.12	SKF Ecorubber-3 ²⁾				
 	Pneumatic, single-acting Wiper with mounting cage for press-fit installation into axially open housings. Special design of wiping lip allows retention of initial lubricating film, the use of plastic mounting cages avoids corrosion at the press-fit. For housings according ISO 6195-Type B.			-22	+176	13.12	ECOPUR	Seal ECOPUR H-ECOPUR S-ECOPUR T-ECOPUR X-ECOPUR ³⁾ X-ECOPUR H ³⁾ X-ECOPUR S ³⁾ SKF Ecoflas SKF Ecorubber-H SKF Ecorubber-1 SKF Ecorubber-2 SKF Ecorubber-3 ²⁾	Housing SKF Ecotal ¹⁾ SKF Ecotal ¹⁾
				-4	+176	13.12	H-ECOPUR		
		-4	+176	16.40	S-ECOPUR				
		-40	+176	13.12	T-ECOPUR				
		-22	+176	13.12	X-ECOPUR ³⁾				
		-4	+176	13.12	X-ECOPUR H ³⁾				
		-4	+176	13.12	X-ECOPUR S ³⁾				
		+14	+392	13.12	SKF Ecoflas				
		-13	+176	13.12	SKF Ecorubber-H				
		-22	+176	13.12	SKF Ecorubber-1				
		-4	+392	13.12	SKF Ecorubber-2				
		-58	+302	13.12	SKF Ecorubber-3 ²⁾				

¹⁾ SKF Ecotal up to Ø 10.24 inches, SKF Ecomid above Ø 10.24 inches
²⁾ Not suitable for mineral oils
³⁾ For hard grade polyurethanes, refer to material properties on page 12

Appli- Profile cation	Description	Temperature		Speed max.	Material		
		min.	max.				
		°F		ft/s	-		
 	Hydraulic, single-acting Wiper to fit in angled housings (30° angle).	-22	+230	13.12	ECOPUR		
		-4	+230	13.12	H-ECOPUR		
		-4	+230	13.12	S-ECOPUR		
		-58	+230	13.12	T-ECOPUR		
		-22	+230	13.12	X-ECOPUR ²⁾		
		-4	+230	13.12	X-ECOPUR H ²⁾		
		-4	+230	13.12	X-ECOPUR S ²⁾		
		+14	+392	13.12	SKF Ecoflas		
		-13	+302	13.12	SKF Ecorubber-H		
		-22	+212	13.12	SKF Ecorubber-1		
		-4	+392	13.12	SKF Ecorubber-2		
		-58	+302	13.12	SKF Ecorubber-3 ¹⁾		
		 	Hydraulic/pneumatic, single-acting Wiper usually fixed in housing with clamp flange. Mainly used for replacement in old hydraulic and pneumatic cylinders or for secondary applications.	-22	+230	13.12	ECOPUR
				-31	+230	13.12	ECOPUR LD
-22	+230			13.12	G-ECOPUR		
-22	+230			13.12	G-ECOPUR 54D ²⁾		
-4	+230			13.12	H-ECOPUR		
-4	+230			13.12	S-ECOPUR		
-58	+230			13.12	T-ECOPUR		
-22	+230			13.12	X-ECOPUR ²⁾		
-4	+230			13.12	X-ECOPUR H ²⁾		
-4	+230			13.12	X-ECOPUR S ²⁾		
+14	+392			13.12	SKF Ecoflas		
-13	+302			13.12	SKF Ecorubber-H		
-22	+212			13.12	SKF Ecorubber-1		
-4	+392			13.12	SKF Ecorubber-2		
-58	+302	13.12	SKF Ecorubber-3 ¹⁾				
 	Wiper usually fixed in housing with clamp flange. Mainly used for replacement in old hydraulic and pneumatic cylinders or for secondary applications.	-22	+230	13.12	ECOPUR		
		-31	+230	13.12	ECOPUR LD		
		-22	+230	13.12	G-ECOPUR		
		-22	+230	13.12	G-ECOPUR 54D ²⁾		
		-4	+230	13.12	H-ECOPUR		
		-4	+230	13.12	S-ECOPUR		
		-58	+230	13.12	T-ECOPUR		
		-22	+230	13.12	X-ECOPUR ²⁾		
		-4	+230	13.12	X-ECOPUR H ²⁾		
		-4	+230	13.12	X-ECOPUR S ²⁾		
		+14	+392	13.12	SKF Ecoflas		
		-13	+302	13.12	SKF Ecorubber-H		
		-22	+212	13.12	SKF Ecorubber-1		
		-4	+392	13.12	SKF Ecorubber-2		
-58	+302	13.12	SKF Ecorubber-3 ¹⁾				
 	Hydraulic, single-acting Wiper with dimensioning according to common types used in USA. For housings according AN 6231, ANSI/B93.35.	-22	+230	13.12	ECOPUR		
		-4	+230	13.12	H-ECOPUR		
		-4	+230	13.12	S-ECOPUR		
		-58	+230	13.12	T-ECOPUR		
		-22	+230	13.12	X-ECOPUR ²⁾		
		-4	+230	13.12	X-ECOPUR H ²⁾		
		-4	+230	13.12	X-ECOPUR S ²⁾		
		+14	+392	13.12	SKF Ecoflas		
		-13	+302	13.12	SKF Ecorubber-H		
		-22	+212	13.12	SKF Ecorubber-1		
		-4	+392	13.12	SKF Ecorubber-2		
		-58	+302	13.12	SKF Ecorubber-3 ¹⁾		

¹⁾ Not suitable for mineral oils
²⁾ For hard grade polyurethanes, refer to material properties on page 12

Wipers

Linear moving
 Rotating
 Oscillating
 Spiral moving
 Static
 Grey symbols: contact SKF for application limitations

Appli- Profile cation	Description	Temperature		Speed max.	Material		
		min.	max.				
		°F		ft/s	-		
 	Hydraulic, single-acting Wiper with dimensioning according to common types used in USA. Fixed relation between cross-section and height of wiper. For housings according AN 6231, ANSI/B93.35.	-22	+230	13.12	ECOPUR		
		-4	+230	13.12	H-ECOPUR		
		-4	+230	13.12	S-ECOPUR		
		-58	+230	13.12	T-ECOPUR		
		-22	+230	13.12	X-ECOPUR ²⁾		
		-4	+230	13.12	X-ECOPUR H ²⁾		
		-4	+230	13.12	X-ECOPUR S ²⁾		
		+14	+392	13.12	SKF Ecoflas		
		-13	+302	13.12	SKF Ecorubber-H		
		-22	+212	13.12	SKF Ecorubber-1		
		-4	+392	13.12	SKF Ecorubber-2		
		-58	+302	13.12	SKF Ecorubber-3 ¹⁾		
 	Hydraulic/pneumatic, double-acting Wiper including additional sealing lip, used in combination with O-ring activated PTFE seals (tandem) to reduce residual oil film. Also used as complete solution for pneumatic applications in small diameter range. max. allowed pressure load: 230 psi.	-22	+230	13.12	ECOPUR		
		-31	+230	13.12	ECOPUR LD		
		-22	+230	13.12	G-ECOPUR		
		-4	+230	13.12	H-ECOPUR		
		-4	+230	16.40	S-ECOPUR		
		-58	+230	13.12	T-ECOPUR		
		+14	+392	13.12	SKF Ecoflas		
		-13	+302	13.12	SKF Ecorubber-H		
		-22	+212	13.12	SKF Ecorubber-1		
		-4	+392	13.12	SKF Ecorubber-2		
		-58	+302	13.12	SKF Ecorubber-3 ¹⁾		
		 	Hydraulic/pneumatic, double-acting As profile A11-A, special housing design according ISO 6195-Type C.	-22	+230	13.12	ECOPUR
-4	+230			13.12	H-ECOPUR		
-58	+230			13.12	T-ECOPUR		
-4	+230			16.40	S-ECOPUR		
+14	+392			13.12	SKF Ecoflas		
-13	+302			13.12	SKF Ecorubber-H		
-22	+212			13.12	SKF Ecorubber-1		
-4	+392			13.12	SKF Ecorubber-2		
-58	+302			13.12	SKF Ecorubber-3 ¹⁾		
 	Hydraulic, single-acting Wiper with slight seal support, and extended lip for face sealing against heavy contamination.			-22	+230	13.12	ECOPUR
				-31	+230	13.12	ECOPUR LD
				-22	+230	13.12	G-ECOPUR
		-22	+230	13.12	G-ECOPUR 54D ²⁾		
		-4	+230	13.12	H-ECOPUR		
		-4	+230	16.40	S-ECOPUR		
		-58	+230	13.12	T-ECOPUR		
		-22	+230	13.12	X-ECOPUR ²⁾		
		-4	+230	13.12	X-ECOPUR H ²⁾		
		-4	+230	16.40	X-ECOPUR S ²⁾		

¹⁾ Not suitable for mineral oils
²⁾ For hard grade polyurethanes, refer to material properties on page 12

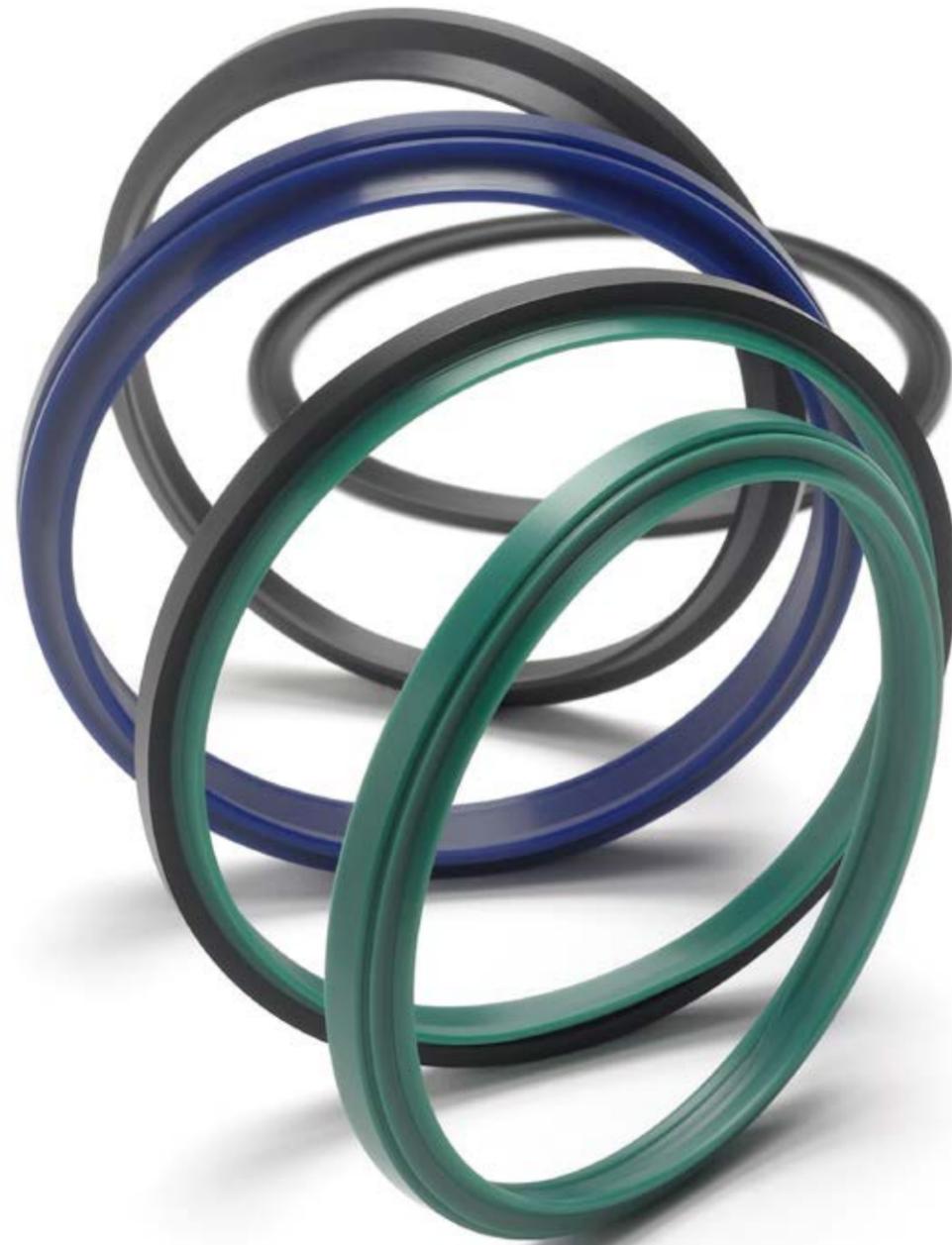
Wipers

Linear moving
 Rotating
 Oscillating
 Spiral moving
 Static
 Grey symbols: contact SKF for application limitations

Appli- Profile cation	Description	Temperature		Speed max.	Pressure max.	Material			
		min.	max.						
		°F		ft/s	psi	-			
 	Hydraulic, double-acting Wiper including additional sealing lip and secondary lip. Used in combination with tandem seal systems to reduce residual oil film. Also used as complete solution for pneumatic applications in small diameter range (max. 16 bar or 230 psi). The technically accurate closure at the cylinder is providing reliable protection, even for heavy contamination.	-22	+230	13.12	230	ECOPUR			
		-31	+230	13.12	230	ECOPUR LD			
		-22	+230	13.12	230	G-ECOPUR			
		-4	+230	13.12	230	H-ECOPUR			
		-4	+230	16.40	230	S-ECOPUR			
		-58	+230	13.12	230	T-ECOPUR			
		 	Hydraulic/pneumatic, single-acting Scraper ring, mainly used in combination with wiper A02 or A01. Firmly clinging dirt and extremely heavy soiling (mud, tar, ice) is wiped off, following elastomeric wiper is protected from damage. Recommended materials provide good dry running properties, high stiffness and breaking strength.	-94	+230	3.28	-	X-ECOPUR	
				-94	+230	3.28	-	X-ECOPUR H	
				-94	+230	3.28	-	X-ECOPUR S	
				-58	+176	3.28	-	SKF Ecotal ¹⁾	
				-328	+194	3.28	-	SKF Ecowear 1000	
-148	+500			3.28	-	SKF Ecopaek			
 	Hydraulic/pneumatic, single-acting PTFE- or X-ECOPUR-wiper with O-ring as preloading element. PTFE part takes over wiping function, O-ring maintains equal contact pressure. Good dry running properties, no "stick-slip". Excellent chemical and thermal resistance (depends on O-ring).			-22	+212	16.40	-	Glide ring	Energizer
				-4	+212	16.40	-	X-ECOPUR	NBR 70
				-4	+212	16.40	-	X-ECOPUR H	NBR 70
				-4	+212	16.40	-	X-ECOPUR S	NBR 70
				-4	+392	32.81	-	SKF Ecoflon 2,3,4	FPM 75
		-22	+212	32.81	-	SKF Ecoflon 2,3,4	NBR 70		
		-67	+194	32.81	-	SKF Ecowear 1000	MVQ 70		
		-22	+194	32.81	-	SKF Ecowear 1000	NBR 70		
		 	Hydraulic/pneumatic, double-acting PTFE- or X-ECOPUR-double wiper with two O-rings as preloading elements. Wiping edge provides a reliable protection against penetration of dust and dirt. Additional sealing lip for reduction of residual oil film if used in combination with O-ring activated PTFE seals type S09 (tandem). Excellent chemical and thermal resistance (depends on O-ring).	-22	+212	16.40	230	Glide ring	Energizer
				-22	+212	16.40	230	G-ECOPUR 54D	NBR 70
				-4	+212	16.40	230	X-ECOPUR	NBR 70
-4	+212			16.40	230	X-ECOPUR H	NBR 70		
-4	+212			16.40	230	X-ECOPUR S	NBR 70		
-4	+392			32.81	230	SKF Ecoflon 2,3,4	FPM 75		
-22	+212			32.81	230	SKF Ecoflon 2,3,4	NBR 70		
-67	+194			32.81	230	SKF Ecowear 1000	MVQ 70		
-22	+194			32.81	230	SKF Ecowear 1000	NBR 70		
 	Hydraulic/pneumatic, double-acting PTFE- or X-ECOPUR-double wiper with O-ring as preloading element. Wiping edge provides a reliable protection against penetration of dust and dirt. Additional sealing lip for reduction of residual oil film if used in combination with O-ring activated PTFE seals type S09 (tandem). Excellent chemical and thermal resistance (depends on O-ring).			-22	+212	16.40	230	Glide ring	Energizer
				-22	+212	16.40	230	G-ECOPUR 54D	NBR 70
		-4	+212	16.40	230	X-ECOPUR	NBR 70		
		-4	+212	16.40	230	X-ECOPUR H	NBR 70		
		-4	+212	16.40	230	X-ECOPUR S	NBR 70		
		-4	+392	32.81	230	SKF Ecoflon 2,3,4	FPM 75		
		-22	+212	32.81	230	SKF Ecoflon 2,3,4	NBR 70		
		-67	+194	32.81	230	SKF Ecowear 1000	MVQ 70		
		-22	+194	32.81	230	SKF Ecowear 1000	NBR 70		

¹⁾ SKF Ecotal up to Ø 10.24 inches, SKF Ecomid above Ø 10.24 inches





Rotary seals

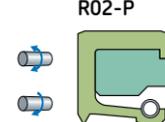
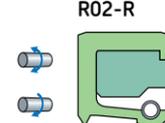
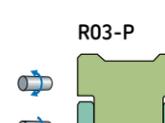
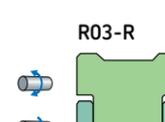
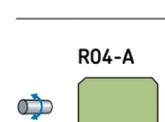
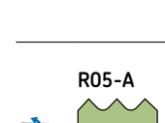
Linear moving
 Rotating
 Oscillating
 Spiral moving
 Static
 Grey symbols: contact SKF for application limitations

Appli- Profile cation	Description	Temperature		Speed max	Pressure max.	Material				
		min.	max.			Seal	Energizer			
		°F		ft/s	psi	-				
	R01-P Single-acting rotary shaft seal Spring loaded lip seal with retainer ring for press-fit installation into axially open housings. Wide range of applications in every sector of industry, mainly as protecting element for bearings.	-22	+176	16.40 ³⁾	7	Seal ECOPUR ECOPUR LD G-ECOPUR H-ECOPUR S-ECOPUR T-ECOPUR	Energizer SKF Ecotal ¹⁾ SKF Ecomid SKF Ecotal ¹⁾ SKF Ecotal ¹⁾ SKF Ecotal ¹⁾ SKF Ecotal ¹⁾			
		-31	+176	16.40 ³⁾	7					
		-22	+176	16.40 ³⁾	7					
		-4	+176	16.40 ³⁾	7					
		-4	+176	19.69 ³⁾	7					
-40	+176	16.40 ³⁾	7							
	R01-R Single-acting rotary shaft seal Spring loaded lip seal with retainer ring for press-fit installation into axially open housings. Easily adaptable for diverse temperatures and media by selection of suitable seal material. Wide range of applications in every sector of industry, mainly as protecting element for bearings.	+14	+392	32.81 ³⁾	7	Seal SKF Ecoflas SKF Ecorubber-H SKF Ecorubber-1 SKF Ecorubber-2 SKF Ecorubber-3 ²⁾ SKF Ecorubber-3 ²⁾ SKF Ecosil SKF Ecosil	Energizer Metal SKF Ecotal ¹⁾ SKF Ecotal ¹⁾ Metal SKF Ecotal ¹⁾ Metal SKF Ecotal ¹⁾ Metal			
		-13	+176	32.81 ³⁾	7					
		-22	+176	32.81 ³⁾	7					
		-4	+392	49.21 ³⁾	7					
		-58	+176	32.81 ³⁾	7					
		-58	+302	32.81 ³⁾	7					
		-58	+176	16.40 ³⁾	3					
		-76	+392	16.40 ³⁾	3					
			R01-AF Single-acting rotary shaft seal Spring loaded lip seal with solid outer section for axially open housings with clamping plate fixation. Mainly used for rolling mills, large gear mechanisms in heavy duty machinery, for shipbuilding industry and civil engineering.	-22	+230			16.40 ³⁾	7	ECOPUR ECOPUR LD G-ECOPUR H-ECOPUR S-ECOPUR T-ECOPUR SKF Ecoflas SKF Ecorubber-H SKF Ecorubber-1 SKF Ecorubber-2 SKF Ecorubber-3 ²⁾ SKF Ecosil
				-31	+230			16.40 ³⁾	7	
-22	+230			16.40 ³⁾	7					
-4	+230			16.40 ³⁾	7					
-4	+230			19.69 ³⁾	7					
-58	+230			16.40 ³⁾	7					
+14	+392			32.81 ³⁾	7					
-13	+302			32.81 ³⁾	7					
-22	+212			32.81 ³⁾	7					
-4	+392			49.21 ³⁾	7					
-58	+302			32.81 ³⁾	3					
-76	+392			16.40 ³⁾	3					
	R01-AS Single-acting rotary shaft seal Split version of a spring loaded lip seal with solid outer section for axially open housings with clamping plate fixation. Mainly used for repair purpose on rolling mills, large gear mechanisms in heavy duty machinery, for shipbuilding industry and civil engineering.			-22	+230	16.40 ³⁾	7	ECOPUR ECOPUR LD G-ECOPUR H-ECOPUR S-ECOPUR T-ECOPUR SKF Ecoflas SKF Ecorubber-H SKF Ecorubber-1 SKF Ecorubber-2 SKF Ecorubber-3 ²⁾ SKF Ecosil		
		-31	+230	16.40 ³⁾	7					
		-22	+230	16.40 ³⁾	7					
		-4	+230	16.40 ³⁾	7					
		-4	+230	19.69 ³⁾	7					
		-58	+230	16.40 ³⁾	7					
		+14	+392	32.81 ³⁾	7					
		-13	+302	32.81 ³⁾	7					
		-22	+212	32.81 ³⁾	7					
		-4	+392	49.21 ³⁾	7					
		-58	+302	32.81 ³⁾	3					
-76	+392	16.40 ³⁾	3							
	R01-F Single-acting rotary shaft seal Spring loaded PTFE-lip seal for axially open housings with clamping plate fixation, elastic secondary seal or integrated O-ring necessary for static sealing in the housing. Excellent chemical and thermal resistance, allowable pressure and speed depend on each other, it is not recommended to use all maximum values simultaneously.	-4	+392	32.81 ³⁾	210	Seal SKF Ecoflon 4 SKF Ecoflon 4	O-Ring FPM 75 NBR 70			
		-22	+212	32.81 ³⁾	210					

¹⁾ SKF Ecotal up to Ø 10.24 inches, SKF Ecomid above Ø 10.24 inches
²⁾ Not suitable for mineral oils
³⁾ Surface speed limit values are depending on heat dissipation ability of the sealing system (shaft diameter, lubrication, ...)

Rotary seals

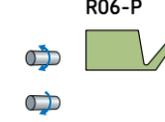
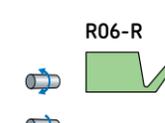
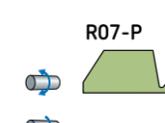
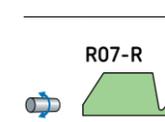
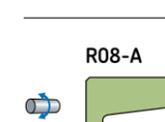
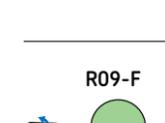
 Linear moving
  Rotating
  Oscillating
  Spiral moving
  Static
 Grey symbols: contact SKF for application limitations

Appli- Profile cation	Description	Temperature		Speed max.	Pressure max.	Material	Material
		min.	max.				
		°F		ft/s	psi	-	
	R02-P Single-acting rotary shaft seal As profile R01-P, but with additional dust lip to avoid ingress of dust and dirt.	-22	+176	16.40 ³⁾	7	Seal ECOPUR ECOPUR LD G-ECOPUR H-ECOPUR S-ECOPUR T-ECOPUR	Energizer SKF Ecotal ¹⁾ SKF Ecomid SKF Ecomid SKF Ecotal ¹⁾ SKF Ecotal ¹⁾ SKF Ecotal ¹⁾
		-31	+176	16.40 ³⁾	7		
		-22	+176	16.40 ³⁾	7		
		-4	+176	16.40 ³⁾	7		
		-4	+176	19.69 ³⁾	7		
		-40	+176	16.40 ³⁾	7		
	R02-R Single-acting rotary shaft seal As profile R01-R, but with additional dust lip to avoid ingress of dust and dirt.	+14	+392	32.81 ³⁾	7	Seal SKF Ecoflas SKF Ecorubber-H SKF Ecorubber-1 SKF Ecorubber-2 SKF Ecorubber-3 ²⁾ SKF Ecorubber-3 ²⁾ SKF Ecosil SKF Ecosil	Energizer Metal SKF Ecotal ¹⁾ SKF Ecotal ¹⁾ Metal SKF Ecotal ¹⁾ Metal SKF Ecotal ¹⁾ Metal
		-13	+176	32.81 ³⁾	7		
		-22	+176	32.81 ³⁾	7		
		-4	+392	49.21 ³⁾	7		
		-58	+176	32.81 ³⁾	7		
		-58	+302	32.81	7		
		-58	+176	16.40 ³⁾	3		
		-76	+392	16.40 ³⁾	3		
			R03-P Double-acting rotary seal Rotary seal with integrated backup rings for pivoting motion in hydraulic systems. Interference fit on outside diameter maintains stable fit in the housing, back-up rings permit larger extrusion gap / higher pressure. Mainly used for rotary pivots on excavators, grabs.	-22	+212		
-4	+212			0.66	5,800		
-4	+212			0.98	5,800		
-40	+212			0.66	5,800		
	R03-R Double-acting rotary seal As profile R03-P, but more adaptation possibilities for diverse temperatures and media by selection of suitable seal material.	+14	+392	0.66	3,600	Seal SKF Ecoflas SKF Ecorubber-H SKF Ecorubber-1 SKF Ecorubber-2 SKF Ecorubber-3 SKF Ecorubber-3	Back-up rings SKF Ecopaek SKF Ecotal ¹⁾ SKF Ecotal ¹⁾ SKF Ecoflon 2 SKF Ecoflon 2 SKF Ecotal ¹⁾
		-13	+212	0.66	3,600		
		-22	+212	0.66	3,600		
		-4	+392	0.66	3,600		
		-58	+302	0.66	3,600		
		-40	+212	0.66	3,600		
	R04-A Double-acting rotary seal Space saving rotary seal for pivoting motion in hydraulic systems. Interference fit on outside diameter maintains stable fit in the housing, dynamic sealing lips on inside diameter.	-22	+230	0.66	2,300	ECOPUR H-ECOPUR S-ECOPUR T-ECOPUR SKF Ecoflas SKF Ecorubber-H SKF Ecorubber-1 SKF Ecorubber-2 SKF Ecorubber-3 ²⁾	
		-4	+230	0.66	2,300		
		-4	+230	0.98	2,300		
		-58	+230	0.66	2,300		
		+14	+392	0.66	1,450		
		-13	+302	0.66	1,450		
		-22	+212	0.66	1,450		
		-4	+392	0.66	1,450		
		-58	+302	0.66	1,450		
	R05-A Double-acting rotary seal Space saving rotary seal for pivoting motion in hydraulic systems. Interference fit on inside diameter maintains stable fit in the housing, dynamic sealing lips on outside diameter.	-22	+230	0.66	2,300	ECOPUR H-ECOPUR S-ECOPUR T-ECOPUR SKF Ecoflas SKF Ecorubber-H SKF Ecorubber-1 SKF Ecorubber-2 SKF Ecorubber-3 ²⁾	
		-4	+230	0.66	2,300		
		-4	+230	0.98	2,300		
		-58	+230	0.66	2,300		
		+14	+392	0.66	1,450		
		-13	+302	0.66	1,450		
		-22	+212	0.66	1,450		
		-4	+392	0.66	1,450		
		-58	+302	0.66	1,450		

¹⁾ SKF Ecotal up to Ø 10.24 inches, SKF Ecomid above Ø 10.24 inches
²⁾ Not suitable for mineral oils
³⁾ Surface speed limit values are depending on heat dissipation ability of the sealing system (shaft diameter, lubrication, ...)

Rotary seals

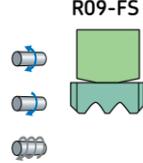
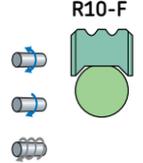
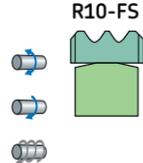
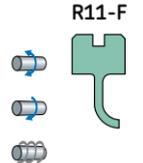
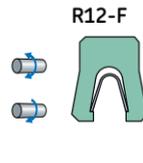
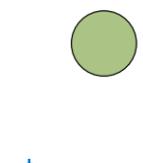
 Linear moving
  Rotating
  Oscillating
  Spiral moving
  Static
 Grey symbols: contact SKF for application limitations

Appli- Profile cation	Description	Temperature		Speed max.	Pressure max.	Material	Material				
		min.	max.								
		°F		ft/s	psi	-					
	R06-P Axially acting rotary seal Elastic, excellent wear resistant V-Ring with interference fit on the shaft, rotates with the shaft, sealing axially against shaft collars, thrust blocks or the outer race of roller bearings, protecting the bearing against dust, dirt, oil splash, watersplash and similar media. Acting as a seal and slinger ring.	-22	+230	82.02	-	ECOPUR ECOPUR LD G-ECOPUR H-ECOPUR S-ECOPUR T-ECOPUR					
		-31	+230	82.02	-						
		-22	+230	82.02	-						
		-4	+230	82.02	-						
		-4	+230	82.02	-						
		-58	+230	82.02	-						
	R06-R Axially acting rotary seal Elastic, good wear resistant V-Ring as profile R06-P, but more adaptation possibilities for diverse temperatures and media by selection of suitable seal material.	+14	+392	82.02	-	SKF Ecoflas SKF Ecorubber-H SKF Ecorubber-1 SKF Ecorubber-2 SKF Ecorubber-3 ¹⁾					
		-13	+302	82.02	-						
		-22	+212	82.02	-						
		-4	+392	82.02	-						
		-58	+302	82.02	-						
	R07-P Axially acting rotary seal Elastic, excellent wear resistant V-Ring with interference fit on the shaft, rotates with the shaft, sealing axially against shaft collars, thrust blocks or the outer race of roller bearings, protecting the bearing against dust, dirt, oil splash, watersplash and similar media. Acting as a seal- and slinger ring.	-22	+230	82.02	-	ECOPUR ECOPUR LD G-ECOPUR H-ECOPUR S-ECOPUR T-ECOPUR					
		-31	+230	82.02	-						
		-22	+230	82.02	-						
		-4	+230	82.02	-						
		-4	+230	82.02	-						
		-58	+230	82.02	-						
	R07-R Axially acting rotary seal Elastic, good wear resistant V-Ring as profile R07-P, but easily adaptable for diverse temperatures and media by selection of suitable seal material.	+14	+392	82.02	-	SKF Ecoflas SKF Ecorubber-H SKF Ecorubber-1 SKF Ecorubber-2 SKF Ecorubber-3 ¹⁾					
		-13	+302	82.02	-						
		-22	+212	82.02	-						
		-4	+392	82.02	-						
		-58	+302	82.02	-						
	R08-A Single-acting rotary seal Springless rotary lip seal with arbitrary preload on inside and outside diameter in order to design the seal to different specific needs.				2)		2)		2)		
	R09-F Double-acting rotary seal O-ring activated, low friction PTFE rotary seal. Mainly used in applications with alternating pressure from one side of the seal to the other, such as hose reels, swivel joints, rotating track rings and machine tool hydraulics. Good chemical and thermal resistance achievable by selection of suitable O-ring material.	-4	+392	1.31	5,000	Glide ring SKF Ecoflon 4 SKF Ecoflon 4	Energizer FPM 75 NBR 70				
		-22	+212	1.31	5,000						

¹⁾ Not suitable for mineral oils

Rotary seals

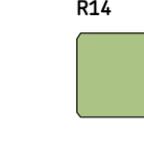
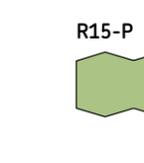
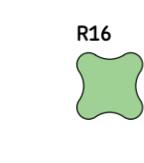
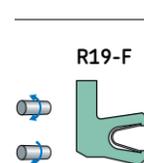
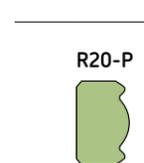
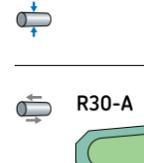
 Linear moving
  Rotating
  Oscillating
  Spiral moving
  Static
 Grey symbols: contact SKF for application limitations

Appli- Profile cation	Description	Temperature		Speed max.	Pressure max.	Material
		min.	max.			
		°F		ft/s	psi	–
	R09-FS Double-acting rotary seal As profile R09-F, but with a profile ring energizer instead of the O-ring. For heavy duty applications and non-standard housings.	-22 -4	+212 +392	1.31 1.31	5,000 5,000	Glide ring SKF Ecoflon 4 Energizer SKF Ecorubber-1 SKF Ecorubber-2
	R10-F Double-acting rotary seal O-ring activated, low friction PTFE rotary seal. Mainly used in applications with alternating pressure from one side of the seal to the other, such as hose reels, swivel joints, rotating track rings and machine tool hydraulics. Good chemical and thermal resistance achievable by selection of suitable O-ring material.	-4 -22	+392 +212	1.31 1.31	5,000 5,000	Glide ring SKF Ecoflon 4 Energizer FPM 75 NBR 70
	R10-FS Double-acting rotary seal As profile R10-F, but with a profile ring energizer instead of the O-ring. For heavy duty applications and non-standard housings.	-22 -4	+212 +392	1.31 1.31	5,000 5,000	Glide ring SKF Ecoflon 4 Energizer SKF Ecorubber-1 SKF Ecorubber-2
	R11-F Single-acting PTFE rotary seal Space saving rotary seal, deformed sealing lip acts self-adjusting on increasing temperature. For axially open housings with clamping plate fixation, elastic secondary seal or integrated O-ring necessary for static sealing in the housing. Excellent chemical and thermal resistance, suitable for high speed applications.	-328	+500	65.62	70	SKF Ecoflon 2,3,4
	R12-F Single-acting PTFE flange seal Fingerspring activated flange seal, excellent chemical and thermal resistance, mainly used on flanges, fittings or pivoting joints in chemical industry.	-328	+500	3.28	4,300	Seal SKF Ecoflon 1,2,3,4 Spring 1.4310 ⁽²⁾
	R13 O-ring Well known, simple O-ring with proven reliability in multiple applications in every sector of industry. Excellent adaptation possibilities for diverse temperatures and media by selection of suitable seal material. Mainly used as static seal or as preloading element for PTFE-seals. For most dynamic applications, we recommend to use S20/K20 or S35/K35.	-22 -31 -22 -4 -4 -58 +14 -13 -22 -4 -58 -76 -328	+230 +230 +230 +230 +230 +230 +392 +302 +212 +392 +302 +392 +302	– – – – – – – – – – – – –	8,700 8,700 8,700 8,700 8,700 8,700 2,300 2,300 2,300 2,300 2,300 2,300 2,300 2,300	ECOPUR ECOPUR LD G-ECOPUR H-ECOPUR S-ECOPUR T-ECOPUR SKF Ecoflas SKF Ecorubber-H SKF Ecorubber-1 SKF Ecorubber-2 SKF Ecorubber-3 ⁽¹⁾ SKF Ecosil SKF Ecoflon 1

¹⁾ Not suitable for mineral oils
²⁾ Depending on the application. Contact SKF for more information.

Rotary seals

 Linear moving
  Rotating
  Oscillating
  Spiral moving
  Static
 Grey symbols: contact SKF for application limitations

Appli- Profile cation	Description	Temperature		Speed max.	Pressure max.	Material
		min.	max.			
		°F		ft/s	psi	–
	R14 Square ring Well-known, simple square ring, mainly used for static applications or as gaskets. Excellent adaptation possibilities for diverse temperatures and media by selection of suitable seal material.	2)		2)	2)	2)
	R15-P Double-acting static seal For static applications as an O-ring replacement to avoid drilling in the housing, simple installation and higher extrusion resistance.	-22 -31 -22 -4 -4 -58	+230 +230 +230 +230 +230	– – – – –	5,800 5,800 5,800 5,800 5,800	ECOPUR ECOPUR LD G-ECOPUR H-ECOPUR S-ECOPUR T-ECOPUR
	R16 Double-acting static seal For static and dynamic applications as an O-ring replacement in radial and axial grooves.	+14 -13 -22 -4 -58	+392 +302 +230 +392 +302	– – – – –	3,600 3,600 3,600 3,600 3,600	SKF Ecoflas SKF Ecorubber-H SKF Ecorubber-1 SKF Ecorubber-2 SKF Ecorubber-3 ⁽¹⁾
	R19-F Single-acting PTFE rotary seal Fingerspring activated PTFE seal with integrated clamping flange on the back of seal for clamping fixation, acting as anti-twist device. Excellent chemical and thermal resistance. Suitable for relatively high pressure and high speed, however, allowable pressure and speed depend on each other. It is not recommended to use all maximum values simultaneously.	-328	+500	6.56	2,100	Seal SKF Ecoflon 1,2,3,4 Spring 1.4310 ⁽⁴⁾
	R20-P Single-acting flange seal Flange seal for static applications, suitable for high pressure range. Direction of pressurization (from inside or outside) must be indicated when ordering the seal.	-22 -31 -22 -4 -4 -58	+230 +230 +230 +230 +230	– – – – –	11,600 11,600 11,600 11,600 11,600	ECOPUR ECOPUR LD G-ECOPUR H-ECOPUR S-ECOPUR T-ECOPUR
	R30-A Valve stem seal with PTFE jacket For low friction, rubber energizer automatically increases preload as it senses leakage. Mainly used as valve seal in oil industry/offshore applications.	-13 -13 -4 -4	+392 +212 +392 +212	1.64 1.64 1.64 1.64	14,500 7,200 14,500 7,200	Seal SKF Ecorubber-H SKF Ecorubber-H SKF Ecorubber-2 SKF Ecorubber-2 Cover SKF Ecoflon ⁽³⁾ SKF Ecoflon ⁽³⁾ SKF Ecoflon ⁽³⁾ SKF Ecoflon ⁽³⁾ Back-up ring SKF Ecopaek SKF Ecotal ⁽⁵⁾ SKF Ecopaek SKF Ecotal ⁽⁵⁾

¹⁾ Not suitable for mineral oils
²⁾ Depending on the application. Contact SKF for more information
³⁾ For all types of SKF Ecoflon, refer to material properties on page 12

⁴⁾ Spring metal material specification
⁵⁾ SKF Ecotal up to Ø 10.24 inches, SKF Ecomid above Ø 10.24 inches

Rotary seals

 Linear moving
  Rotating
  Oscillating
  Spiral moving
  Static
 Grey symbols: contact SKF for application limitations

Appli- Profile cation	Description	Temperature		Speed max.	Pressure max.	Material
		min.	max.			
		°F		ft/s	psi	-
  	Single-acting flange seal Flange seal for static applications, suitable for high pressure range. Direction of pressurization (from inside or outside) must be indicated when ordering the seal.	-22	+230	-	11,600	ECOPUR
		-31	+230	-	11,600	ECOPUR LD
		-22	+230	-	11,600	G-ECOPUR
		-4	+230	-	11,600	H-ECOPUR
		-4	+230	-	11,600	S-ECOPUR
		-58	+230	-	11,600	T-ECOPUR
		+14	+392	-	3,600	SKF Ecoflas
		-13	+302	-	3,600	SKF Ecorubber-H
		-22	+212	-	3,600	SKF Ecorubber-1
		-4	+392	-	3,600	SKF Ecorubber-2
		-58	+302	-	3,600	SKF Ecorubber-3 ¹⁾
		-76	+392	-	3,600	SKF Ecosil

¹⁾ Not suitable for mineral oils

Guide rings

 Linear moving
  Rotating
  Oscillating
  Spiral moving
  Static
 Grey symbols: contact SKF for application limitations

Appli- Profile cation	Description	Temperature		Speed max.	Specific load ³⁾ max.	Material
		min.	max.			
		°F		ft/s	psi	-
  	Guide ring F01 Most common guide ring for rod or piston application. Used in many standard cylinders, majority of applications require split version for installation into closed housings, non split design available (bushings).	-328	+392	13.12	435	SKF Ecoflon 2
		-328	+392	16.40	653	SKF Ecoflon 3
		-58	+212	13.12	3,626	SKF Ecotal ¹⁾
  	Guide ring F02 For rod or piston application, split and non split design available. Not only used as guide ring, also as plain washer or spacer.	-328	+392	13.12	435	SKF Ecoflon 2
		-328	+392	16.40	653	SKF Ecoflon 3
		-58	+212	13.12	3,626	SKF Ecotal ¹⁾
  	Guide ring F03 For piston application. Angled design combines guide ring and back-up ring function. Split and non split design available.	-328	+392	13.12	435	SKF Ecoflon 2
		-328	+392	16.40	653	SKF Ecoflon 3
		-58	+212	13.12	3,626	SKF Ecotal ¹⁾
  	Guide ring F04 Same as profile F03 but for rod application.	-328	+392	13.12	435	SKF Ecoflon 2
		-328	+392	16.40	653	SKF Ecoflon 3
		-58	+212	13.12	3,626	SKF Ecotal ¹⁾
  	Guide ring F05 With integrated collar on inside diameter, for piston application. Split and non split design available.	-328	+392	13.12	435	SKF Ecoflon 2
		-328	+392	16.40	653	SKF Ecoflon 3
		-58	+212	13.12	3,626	SKF Ecotal ¹⁾
  	Guide ring F06 With integrated collar on outside diameter, for rod application. Split and non split design available.	-328	+392	13.12	435	SKF Ecoflon 2
		-328	+392	16.40	653	SKF Ecoflon 3
		-58	+212	13.12	3,626	SKF Ecotal ¹⁾

¹⁾ SKF Ecotal up to Ø 10.24 inches, SKF Ecomid above Ø 10.24 inches

²⁾ Special fabric reinforced material, available as a guide tape only

³⁾ Depending on temperature and allowable compression. Contact SKF for more information

Guide rings

 Linear moving
  Rotating
  Oscillating
  Spiral moving
  Static

Grey symbols: contact SKF for application limitations

Appli- cation	Profile	Description	Temperature		Speed max.	Specific load ²⁾ max.	Material
			min.	max.			
			°F		ft/s	psi	–
   	F07 Guide ring F07 With groove on inside diameter, for piston application. Split and non split design available.	–328	+392	13.12	435	SKF Ecoflon 2	
		–328	+392	16.40	653	SKF Ecoflon 3	
		–58	+212	13.12	3,626	SKF Ecotal ¹⁾	
   	F08 Guide ring F08 With groove on outside diameter, for rod application. Split and non split design available.	–328	+392	13.12	435	SKF Ecoflon 2	
		–328	+392	16.40	653	SKF Ecoflon 3	
		–58	+212	13.12	3,626	SKF Ecotal ¹⁾	



¹⁾ SKF Ecotal up to Ø 10.24 inches, SKF Ecomid above Ø 10.24 inches
²⁾ Depending on temperature and allowable compression. Contact SKF for more information

Back-up rings

 Linear moving
  Rotating
  Oscillating
  Spiral moving
  Static
 Grey symbols: contact SKF for application limitations

Appli- Profile cation	Description	Temperature		Material
		min.	max.	
		°F		-
 ST08  	Back-up ring Common inactive back-up ring, mainly used with O-rings to avoid gap extrusion. Split and non split design available.	-94	+230	ECOPUR
		-94	+230	ECOPUR LD
		-94	+230	G-ECOPUR
		-94	+230	G-ECOPUR 54D
		-94	+230	H-ECOPUR
		-94	+230	S-ECOPUR
		-94	+230	T-ECOPUR
		-94	+230	X-ECOPUR
		-94	+230	X-ECOPUR H
		-94	+230	X-ECOPUR S
		-328	+500	SKF Ecoflon 1
		-328	+500	SKF Ecoflon 2
		-40	+212	SKF Ecomid ²⁾
		-148	+500	SKF Ecopaek
		-58	+212	SKF Ecotal ¹⁾
 ST09  	Back-up ring Common inactive back-up ring especially for O-rings to avoid gap extrusion. Split and non split design available.	-94	+230	ECOPUR
		-94	+230	ECOPUR LD
		-94	+230	G-ECOPUR
		-94	+230	G-ECOPUR 54D
		-94	+230	H-ECOPUR
		-94	+230	S-ECOPUR
		-94	+230	T-ECOPUR
		-94	+230	X-ECOPUR
		-94	+230	X-ECOPUR H
		-94	+230	X-ECOPUR S
		-328	+500	SKF Ecoflon 1
		-328	+500	SKF Ecoflon 2
		-40	+212	SKF Ecomid ²⁾
		-148	+500	SKF Ecopaek
		-58	+212	SKF Ecotal ¹⁾
 ST10  	Back-up ring Standard active back-up ring for piston seal type PD. Normally already included in PD-type seal profiles, designed for automatic pressure activation. Split and non split design available.	-328	+500	SKF Ecoflon 2
		-40	+212	SKF Ecomid ²⁾
		-148	+500	SKF Ecopaek
		-58	+212	SKF Ecotal ¹⁾
 ST11  	Back-up ring Standard active back-up ring for rod seal type PD. Normally already included in PD-type seal profiles, designed for automatic pressure activation. Split and non split design available.	-328	+500	SKF Ecoflon 2
		-40	+212	SKF Ecomid ²⁾
		-148	+500	SKF Ecopaek
		-58	+212	SKF Ecotal ¹⁾
 ST12  	Back-up ring Triangular back-up ring for rod applications, fits in special shaped housings (see seal data sheets). Also used as integrated active back-up ring in special high pressure or low friction seal profiles. Split and non split design available.	-328	+500	SKF Ecoflon 2
		-40	+212	SKF Ecomid ²⁾
		-148	+500	SKF Ecopaek
		-58	+212	SKF Ecotal ¹⁾

¹⁾ Up to Ø 10.24 inches
²⁾ Above Ø 10.24 inches

Back-up rings

 Linear moving
  Rotating
  Oscillating
  Spiral moving
  Static
 Grey symbols: contact SKF for application limitations

Appli- Profile cation	Description	Temperature		Material
		min.	max.	
		°F		-
 ST13  	Back-up ring Triangular back-up ring for piston applications, fits in special shaped housings (see seal data sheets). Also used as integrated active back-up ring in special high pressure or low friction seal profiles. Split and non split design available.	-328	+500	SKF Ecoflon 2
		-40	+212	SKF Ecomid ²⁾
		-148	+500	SKF Ecopaek
		-58	+212	SKF Ecotal ¹⁾

¹⁾ Up to Ø 10.24 inches
²⁾ Above Ø 10.24 inches

B

Static seals

Beside the conventional O-rings and square-rings, SKF offers a standard range of specialized seals for static applications. Most of profiles listed below fit in standard

O-ring-grooves (housings) and can be substituted easily without any rework of housing dimensions.

Appli- Profile cation	Description
	Universal type Most common and simple seal profiles with proven reliability in a wide range of different applications and industries.
	Inside sealing type Interference fit on outside diameter provides stable fit in the housing and reliable performance at all pressures.
	Outside sealing type Interference fit on inside diameter provides stable fit in the housing and reliable performance at all pressures.
	Axial sealing type Robust profiles mainly used as flange seals, inside or outside pressurization possible. Direction of pressurization (from inside or outside) must be indicated when ordering the seal.

Tailor-made solutions

In addition to the standard range of static seals, SKF offers special tailor-made static seal profiles to satisfy the very specific needs of every customer in every industry.

Appli- Profile cation	Description
	Tailor-made solutions These special profiles are just some examples of SKF's wide and flexible machining capabilities.

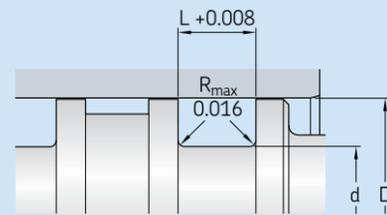


Piston seal housing details and recommendations

The table on the right shows an example of standard housing measurements for piston seals.

Please note that SKF can produce these profiles to application specific requirements or any non-standard housing.

Suggested standard housing dimension



Indicated dimensions are required to process an order
 D bore diameter
 d housing groove diameter
 L housing groove length
 c/s cross section

Surface properties

$R_{t\max}$	R_a
μin	

Sliding surface for

TPU/rubber seals	≤ 98.5	≤ 3.9–19.7
PTFE seals	≤ 78.8	≤ 2.0–11.8

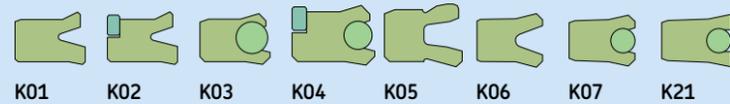
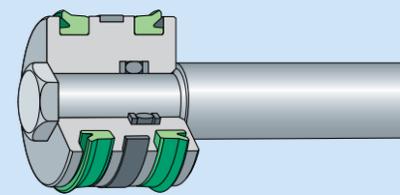
Groove bottom	≤ 248.2	≤ 63.0
Groove face	≤ 591.0	≤ 118.2

Bearing area T_p 50–95%¹⁾

Seal housing tolerances

D H9
 d h10

¹⁾ at a cutting depth of 0,5 R_z based on $C_{ref} = 0\%$



Main function
 Single-acting piston seals lip type (U-cup) seals compact seals.

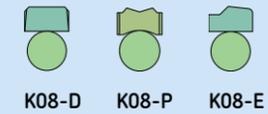
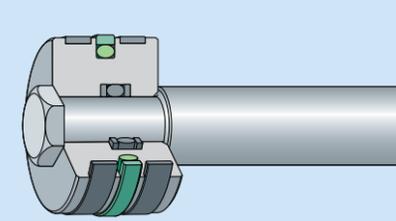
Main applications
 Support and retaining cylinders, standard cylinders.

Advantages
 Stable fit in the housing, ultimate sealing effect, wide temperature range.

Standard materials
 ECOPUR, SKF Ecorubber (all types).

Bore diameter	Housing groove diameter		Housing groove length	Cross section
	d	L		
D over incl.	in		in	in
0.55	0.98	D–0.32	0.24	0.16
0.98	1.97	D–0.39	0.28	0.20
1.97	2.95	D–0.47	0.32	0.24
2.95	5.91	D–0.59	0.39	0.30
5.91	11.81	D–0.79	0.47	0.39
11.81	19.69	D–0.98	0.71	0.49
19.69	29.53 ¹⁾	D–1.18	0.79	0.59
29.53 ¹⁾		D–1.57	1.02	0.79

¹⁾ Not all profiles are available above 23.62 inches



Main function
 Single/double-acting piston seals, o-ring activated PTFE (TPU) seals.

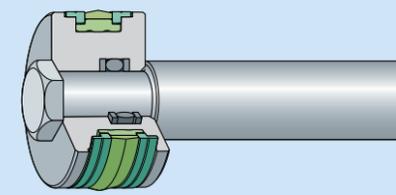
Main applications
 Standard cylinders for positioning functions, mobile hydraulics, etc.

Advantages
 Low friction, no stick-slip, excellent resistance against pressure shocks.

Standard materials
 SKF Ecoflon/NBR
 SKF Ecoflon/FKM
 X-ECOPUR/NBR.

Bore diameter	Housing groove diameter		Housing groove length	Cross section
	d	L		
D over incl.	in		in	in
0.31	0.59	D–0.19	0.09	0.10
0.59	1.57	D–0.30	0.13	0.15
1.57	3.15	D–0.43	0.17	0.22
3.15	5.24	D–0.61	0.25	0.31
5.24	12.99	D–0.83	0.32	0.41
12.99	26.38	D–0.96	0.32	0.48
26.38	39.37	D–1.10	0.37	0.55 ¹⁾
39.37		D–1.50	0.37	0.75 ¹⁾

¹⁾ Only profiles K08-D and K08-E, not for profile K08-P



K09-H
Main function
 Double-acting piston seal, compact type.

Main applications
 Support and retaining cylinders, standard cylinders.

Advantages
 Excellent static and dynamic sealing capacity, integrated back-up rings.

Standard materials
 ECOPUR / SKF Ecorubber / SKF Ectotal.

Bore diameter	Housing groove diameter		Housing groove length	
	d	d ₁	L ¹⁾	L ₁ ¹⁾
D over incl.	in		in	
0.79	1.97	D–0.39	D–0.12	0.49
1.97	3.15	D–0.59	D–0.16	0.79
3.15	5.91	D–0.79	D–0.20	0.98
5.91	15.75	D–0.98	D–0.24	1.26
15.75		D–1.18	D–0.31	1.42

¹⁾ Not valid for profile K09-H

Rod seal housing details and recommendations

The table on the right shows an example of standard housing measurements for rod seals.

Please note that SKF can produce these profiles to application specific requirements or any non-standard housing.

Suggested standard housing dimension

Surface properties
 $R_{t\max}$ R_a

	μin	
Sliding surface for		
TPU/rubber seals	≤ 98.5	$\leq 3.9\text{--}19.7$
PTFE seals	≤ 78.8	$\leq 2.0\text{--}11.8$
Groove bottom	≤ 248.2	≤ 63.0
Groove face	≤ 591.0	≤ 118.2
Bearing area T_p	50–95% ¹⁾	

Seal housing tolerances
 D H10
 d f8

Indicated dimensions are required to process an order
 D housing groove diameter
 d rod diameter
 L housing groove length
 c/s cross section

¹⁾ at a cutting depth of 0,5 R_z based on $C_{ref} = 0\%$

S09-E S09-P S09-D

Main function
 Single/double-acting rod seals, O-ring activated PTFE (TPU) seals.

Main applications
 Earth moving equipment, heavy hydraulics.

Advantages
 Excellent resistance against pressure shocks, long lifetime.

Standard materials
 SKF Ecoflon/NBR or SKF Ecoflon/FKM, X-ECOPUR/NBR.

Rod diameter		Housing groove diameter D	Housing groove length L	Cross section c/s
d over	incl.			
0.20	0.31	d + 0.19	0.09	0.10
0.31	0.75	d + 0.29	0.13	0.14
0.75	1.50	d + 0.42	0.17	0.21
1.50	7.87	d + 0.59	0.25	0.30
7.87	10.08	d + 0.80	0.32	0.40
10.08	25.59 ¹⁾	d + 0.94	0.32	0.47
25.59	39.37 ¹⁾	d + 1.08	0.37	0.54
39.37		d + 1.08	0.37	0.54

¹⁾ Not all profiles available above 600 mm

S01 S02¹⁾ S03 S04¹⁾ S05 S06 S07 S08 S24¹⁾

Main function
 Single-acting rod seals lip type (U-cup) seals compact seals.

Main applications
 Standard cylinders, light and standard hydraulic applications.

Advantages
 Stable fit in the housing, ultimate sealing effect, wide temperature range, good backpumping ability.

Standard materials
 ECOPUR, SKF Ecorubber (all types)

Rod diameter		Housing groove diameter D	Housing groove length L	Cross section c/s
d over	incl.			
0.20	0.98 ¹⁾	d + 0.32	0.25	0.16
0.98	1.97	d + 0.39	0.31	0.20
1.97	5.91	d + 0.59	0.39	0.30
5.91	11.81	d + 0.79	0.55	0.39
11.81	19.69	d + 0.98	0.67	0.49
19.69	27.56 ²⁾	d + 1.18	0.98	0.59
27.56	39.37 ²⁾	d + 1.57	1.26	0.79
39.37		d + 1.57	1.26	0.79

¹⁾ Restrictions in minimum diameter for profiles with back-up rings. Please consult our technical department for exact limitations.
²⁾ Not all profiles available above 23.62 inches

S1012 S1315

Main function
 Single-acting rod seals, chevron packings.

Main applications
 Heavy industry hydraulics, presses.

Advantages
 Suitable for old, worn rods, split version for easy installation available.

Standard materials
 ECOPUR / SKF Ecotal.

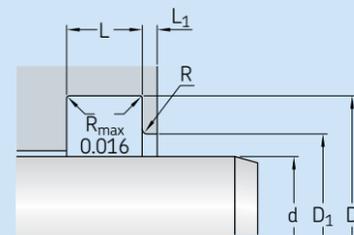
Rod diameter		Housing groove diameter D	Housing groove length L	Cross section c/s
d over	incl.			
0.39	1.57	d + 0.39	0.63	0.20
1.57	2.95	d + 0.59	0.98	0.30
2.95	5.91	d + 0.79	1.26	0.39
5.91	7.87	d + 0.98	1.57	0.49
7.87	11.81	d + 1.18	1.97	0.59
11.81		d + 1.57	2.48	0.79

Wiper housing details and recommendations

The table on the right shows an example of standard housing measurements for wipers.

Please note that SKF can produce these profiles to application specific requirements or any non-standard housing.

Suggested standard housing dimension



Indicated dimensions are required to process an order

- D housing groove diameter
- d rod diameter
- L housing groove width
- H total wiper height

¹⁾ at a cutting depth of 0,5 R_z based on C_{ref} = 0%

Surface properties

R_{t max} R_a

µin

Sliding surface for

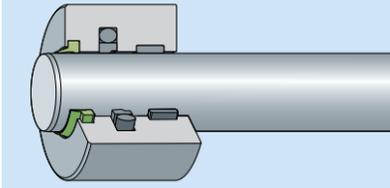
TPU/rubber seals	≤ 98.5	≤ 3.9–19.7
PTFE seals	≤ 78.8	≤ 2.0–11.8

Groove bottom	≤ 248.2	≤ 63.0
Groove face	≤ 591.0	≤ 118.2

Bearing area T_p 50–95%¹⁾

Seal housing tolerances

D ₁ H11	L < 0.39in +0.01
D H11	L > 0.39in +0.01



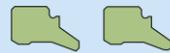
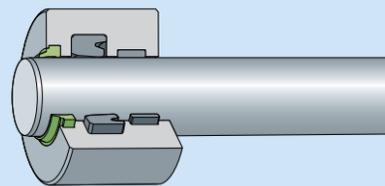
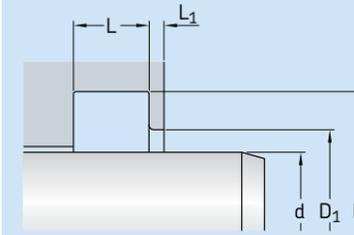
A02 A05 A11
Main function
Single/double-acting wipers.

Main applications
In combination with O-ring activated PTFE rod seals (S09).

Advantages
Excellent wear resistance, double-acting function.

Standard materials
ECOPUR (X-ECOPUR) / SKF Ecorubber.

Rod diameter		Housing groove diameter		Housing groove width		Total wiper height
d over	incl.	D	D ₁	L	L ₁ min	H
in		in		in		in
0.24	1.97	d + 0.32	d + 0.16	0.20	0.08	0.315
1.97	3.94	d + 0.39	d + 0.20	0.24	0.08	0.382
3.94		d + 0.59	d + 0.28	0.33	0.08	0.512



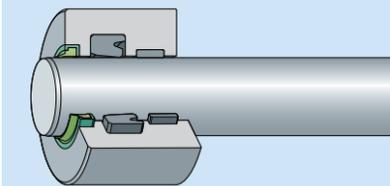
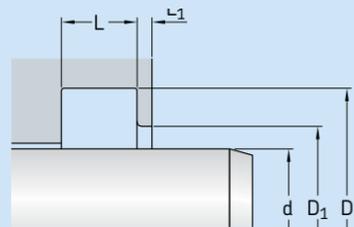
A01 A04
Main function
Single-acting wipers.

Main applications
Standard wiper for hydraulics.

Advantages
Easy installation (snap-in), excellent wear resistance, technically accurate closure.

Standard materials
ECOPUR (X-ECOPUR) / SKF Ecorubber.

Rod diameter		Housing groove diameter		Housing groove width		Total wiper height
d over	incl.	D	D ₁	L	L ₁	H
in		in		in		in
0.24	3.94	d + 0.32	d + 0.24	0.16	0.04	0.275
3.94	5.91	d + 0.47	d + 0.35	0.22	0.06	0.394
5.91		d + 0.59	d + 0.43	0.22	0.08	0.312



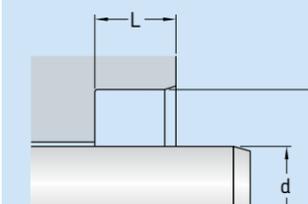
A03 A06
Main function
Single-acting wipers.

Main applications
Standard hydraulic applications, pressfit for axially open housings.

Advantages
Excellent wear resistance, plastic retainer ring, no oxidation problem between retainer and housing.

Standard materials
ECOPUR (X-ECOPUR) + SKF Ecotal / SKF Ecorubber + SKF Ecotal.

Rod diameter		Housing groove diameter	Housing groove width	Total height
d over	incl.	D	L	H
in		in	in	in
0.24	0.39	d + 0.32	0.20	0.31
0.39	3.94	d + 0.39	0.28	0.39
3.94	7.87	d + 0.59	0.35	0.47
7.87		d + 0.79	0.47	0.63

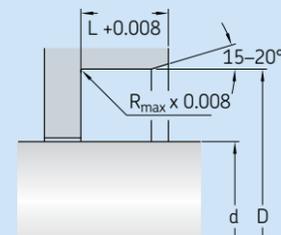


Rotary seal housing details and recommendations

The table on the right shows an example of standard housing measurements for rotary seals.

Please note that SKF can produce these profiles to application specific requirements or any non-standard housing.

Suggested standard housing dimension



Indicated dimensions are required to process an order

D housing groove diameter
d shaft diameter
L housing groove length
c/s cross section

Surface properties

$R_{t\max}$ R_a

μin

Sliding surface for

TPU/rubber seals ≤ 98.5 $\leq 3.9\text{--}19.7$
PTFE seals ≤ 78.8 $\leq 2.0\text{--}11.8$

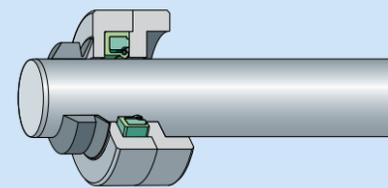
Groove bottom ≤ 248.2 ≤ 63.0
Groove face ≤ 591.0 ≤ 118.2

Bearing area T_p 50–95%¹⁾

Seal housing tolerances

depending on seal profile

¹⁾ at a cutting depth of 0,5 R_z based on $C_{ref} = 0\%$



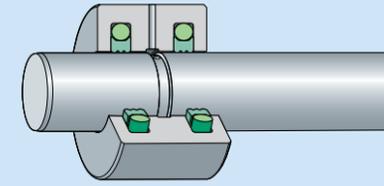
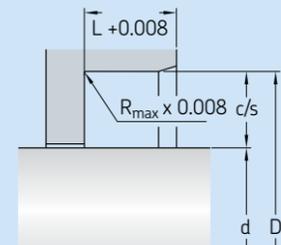
R01 R02
Main function
Single-acting rotary seals,
oil seals,
radial shaft seals.

Main applications
Bearing protection.

Advantages
Easily adaptable for diverse
temperatures and media.

Standard materials
ECOPUR, SKF Ecorubber/SKF Ecotal,
Aluminium.

Shaft diameter		Housing groove diameter D	Housing groove length L	Cross section c/s
d over	incl.			
in	in	in	in	in
0.24	2.36	d + 0.47	0.28	0.24
2.36	5.51	d + 0.59	0.31	0.30
5.51	11.81	d + 0.79	0.39	0.39
11.81	19.69	d + 1.18	0.47	0.59
19.69	31.50	d + 1.57	0.79	0.79
31.50		d + 1.97	0.87	0.98



R09

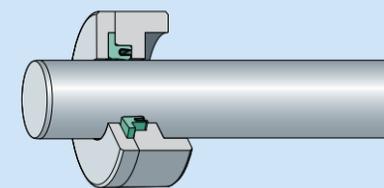
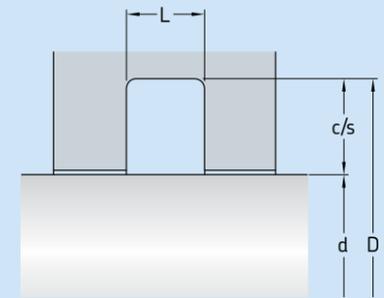
Main function
Double-acting rotary seal,
O-ring activated PTFE seal.

Main applications
Rotary pivots.

Advantages
For high pressure.

Standard materials
SKF Ecoflon NBR or FKM.

Shaft diameter		Housing groove diameter D	Housing groove length L	Cross section c/s
d over	incl.			
in	in	in	in	in
0.24	0.75	d + 0.19	0.09	0.10
0.75	1.50	d + 0.30	0.13	0.15
1.50	7.87	d + 0.43	0.17	0.22
7.87	10.08	d + 0.61	0.25	0.31
10.08	25.59	d + 0.83	0.32	0.41
25.59		d + 1.10	0.37	0.55



R19

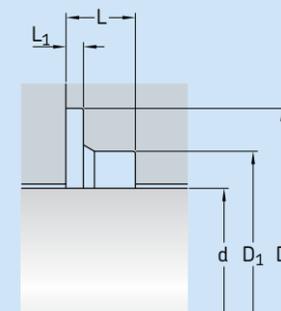
Main function
Single-acting rotary seal,
spring activated PTFE seal.

Main applications
Bearing protection for chemical and
pharma industries.

Advantages
Low friction, good chemical and
thermal resistance, suitable for high
speed.

Standard materials
SKF Ecoflon, stainless steel spring.

Shaft diameter		Housing groove diameter		Housing groove length	
d over	incl.	D	D ₁	L	L ₁
in	in	in	in	in	in
0.20	0.79	d + 0.35	d + 0.20	0.14	0.03
0.79	1.57	d + 0.51	d + 0.28	0.19	0.05
1.57	15.75	d + 0.69	d + 0.41	0.28	0.07
15.75		d + 0.87	d + 0.55	0.37	0.11

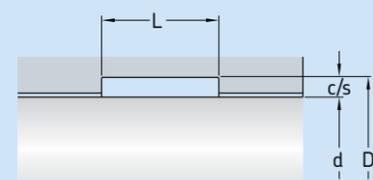


Guide ring housing details and recommendations

Guide ring housing details and recommendations for dynamic applications. SKF standard guide rings are available as 45° split versions. Those can be ordered as well as endless, 90° split versions or yard ware.

Seal housing tolerances

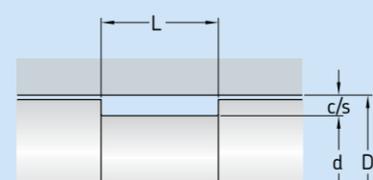
D H9
d f8
L +0.008



F01

Main function
Rod guide rings

Rod diameter		Housing groove diameter D	Housing groove length L	Cross section c/s
d over	incl.			
0.24	1.18	d + 0.12	0.16	0.06
1.18	1.97	d + 0.12	0.22	0.06
1.97	3.94	d + 0.20	0.38	0.10
3.94	31.50	d + 0.20	0.59	0.10
31.50	39.37	d + 0.31	0.98	0.16
39.37		d + 0.31	0.98	0.16



F01

Main function
Piston guide rings

Bore diameter		Housing groove diameter d	Housing groove length L	Cross section c/s
D over	incl.			
0.24	1.18	D - 0.12	0.16	0.06
1.18	1.97	D - 0.12	0.22	0.06
1.97	3.94	D - 0.20	0.38	0.10
3.94	31.50	D - 0.20	0.59	0.10
31.50	39.37	D - 0.31	0.98	0.16
39.37		D - 0.31	0.98	0.16

O-ring housing details and recommendations

Housing tolerances

f7 / H8

Bearing area

50–95% at a cutting depth of 0.5 R_z
based on C_{ref} = 0%

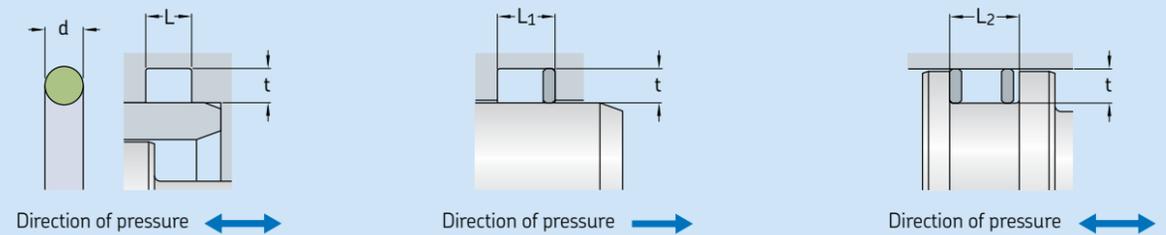
Surface roughness

Surface	Pressure constant		pulsating	
	R _{tmax}	R _a	R _{tmax}	R _a
	μin		μin	
Sliding surface ¹⁾	492.5	126.1	248.2	63.0
Bottom of groove ²⁾	492.5	126.1	248.2	63.0
Groove face	492.5	126.1	248.2	63.0

¹⁾ R_{tmax} / R_a for dynamic application 1.6 μm / 0.4 μm

²⁾ R_{tmax} / R_a for dynamic application 6.3 μm / 1.6 μm

O-ring housing recommendations for static applications



Cord d	Groove t	Without back-up ring L	One back-up ring L ₁	Two back-up rings L ₂	Recommended back-up ring width
0.06	0.04	0.08	0.12	0.16	0.04
0.07	0.05	0.10	0.14	0.18	0.04
0.08	0.06	0.11	0.17	0.22	0.06
0.10	0.08	0.13	0.19	0.25	0.06
0.10	0.09	0.14	0.20	0.26	0.06
0.12	0.10	0.15	0.21	0.27	0.06
0.14	0.12	0.17	0.23	0.29	0.06
0.14	0.12	0.17	0.23	0.29	0.06
0.16	0.13	0.20	0.26	0.33	0.07
0.20	0.17	0.25	0.31	0.38	0.07
0.21	0.18	0.26	0.33	0.40	0.07
0.22	0.19	0.28	0.36	0.44	0.08
0.24	0.20	0.30	0.37	0.45	0.08
0.28	0.23	0.35	0.43	0.50	0.08
0.28	0.23	0.35	0.43	0.50	0.08
0.31	0.27	0.39	0.49	0.59	0.10
0.39	0.33	0.49	0.59	0.69	0.10

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