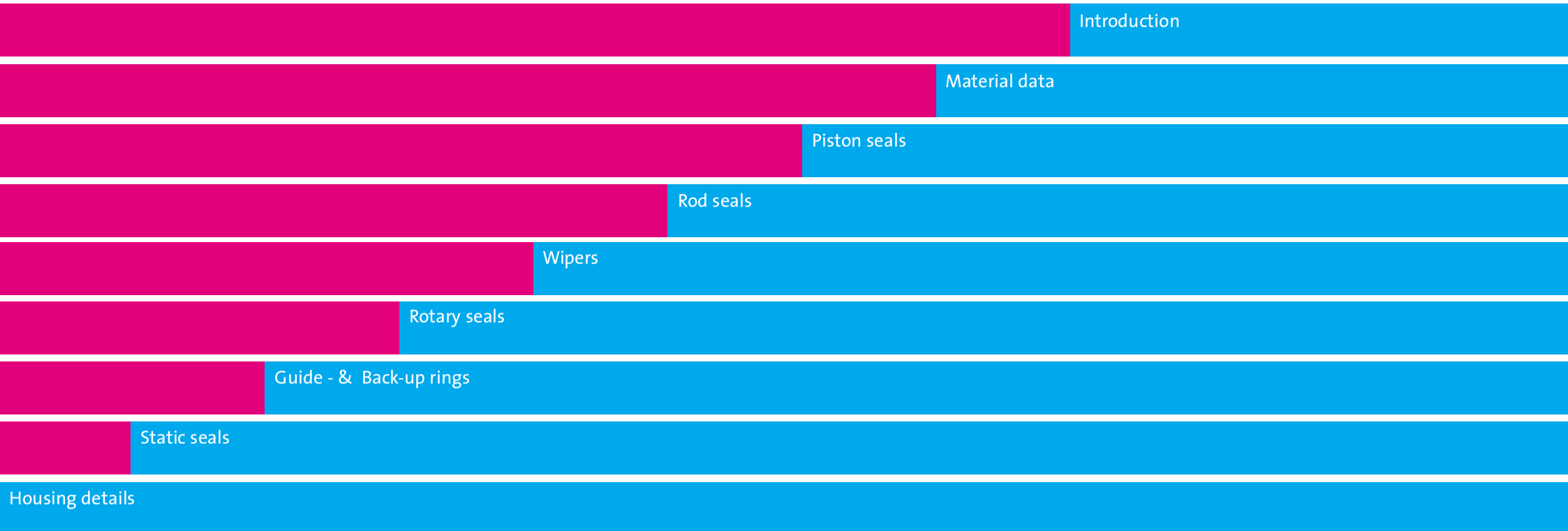
Product range

SEALS

ECONOMOS®

quality sealing solutions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Due to our production process we are able to produce any special seal profile in any diameter (up to 4.000 mm). Therefore - in combination with our R&D department - we can offer tailormade sealing solutions to our customers. Furthermore we produce a wide range of gasket types, engineering plastic parts (EPP) and advanced engineering plastics products (AEPP).

Do not hesitate to contact our technical department for further informations.

Whenever it comes to sealing technology, we are your most versatile partner.

It is our pleasure to service your sealing needs

At Economos, we offer you:

- Sealing solutions tailored to your specifications
- Partnership from the design phase to serial production
- Just-in-time manufacturing of seals and components up to 4.000 mm diameter
- Production of gaskets in miscellaneous materials by water-jet-cutting technology
- Production of Advanced Engineering Plastics Products (AEPP)

Quality makes the difference

Quality is at the core of everything we do. Production breakdowns due to sealing problems can cause huge losses. Therefore, we make every effort to deliver high quality sealing products that meet our customers' needs. At Economos, we are constantly striving to enforce and improve our quality standards, since customers demand the highest quality sealing solutions to compete in their highly competitive markets and thereby gain a competitive edge on their competitors.

Superior manufacturing concept

At Economos we know that only state-of-the-art technology can provide us with an edge on our competitors. A rapidly changing environment demands new production concepts that surpass our customers' requirements, such as:

- Delivery on demand with short cycle times
- No mould or tooling limitations
- No stock requirements for our customers
- Seal engineering to customer specification

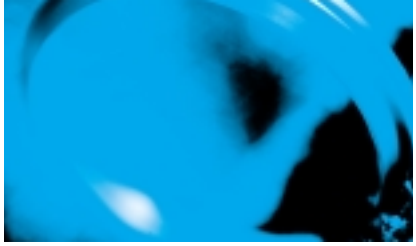
To face this challenge, we developed the Seal-Jet System to manufacture seals with cutting edge CNC turning technology to satisfy the very specific needs of every customer, in every industry.

A global partner to share your vision

Wherever sealing is an issue, that's where we do our business. At Economos, we offer innovative sealing solutions that make us the first call when it comes to sealing technology. We provide a comprehensive technical service and are committed to supply a complete sealing solution best suited to our customers' needs.
Our world wide network of subsidiaries and partners allows us to meet these needs any time, anywhere, around the globe.

High performance sealing materials

At Economos, we know that only high performance materials can meet the demands of the marketplace today and tomorrow. For this reason, we have invested in a state-of-the-art R&D center at our Austrian group headquarters to constantly improve our materials and seal design, thus maintaining our sealing industry leadership. The Economos family of polyurethanes for instance, is renowned throughout the world.
This in-house expertise in the field of high performance sealing materials, combined with close co-operations with universities, has given us a competitive edge on our competitors. We offer our customers not only a wide range of class leading standard materials, but we can also develop specialist compounds to meet specific needs when required.



Classification of sealing materials

In sealing technology, mainly representatives of two groups of macromolecular (polymeric) substances are used, i.e. substances of the groups of **elastomers** and **thermoplastics**.
Macromolecular substances are organic compounds whose molecules exist of several thousands, often even millions, of atoms which are 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).

Elastomers

ECOPUR, ECORUBBER, ...

Elastomers are materials that can be highly expanded by exerting relatively little power. Because of their structure, elastomers have a high elasticity and resilience, which means the remaining deformation is very small. There are two main groups of elastomers, the chemically cross-linked materials (rubber materials) and thermoplastic elastomers.

The **thermoplastic elastomers** (e.g. TPU, TPE, ...) demonstrate the characteristic properties of elastomers over a wide temperature range. They are physically but not chemically cross-linked, therefore they can be melted at higher temperature and can be processed with traditional thermoplastic processing techniques. Thermoplastic elastomers are soluble, generally, they swell less in comparison to their chemically cross-linked equivalents.

The **rubber materials** or elastomers (e.g. NBR, FPM, EPDM, ...) are polymers, which are formed by cross-linked macromolecules with various vulcanization additives. Due to their chemical cross-linking they do not melt and they begin to decompose at high temperatures. In addition the cross-link ensures that rubber materials do not dissolve and, depending on the medium, do suffer more or less intensive swell or shrinkage.

Thermoplastics

ECOTAL, ECOMID, ECOFLON, ECOPAEK,...

Thermoplastics can be melted. They are polymer materials, which are essentially harder and 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. Thermoplastics are therefore called plastomers.

Plastomers are mainly used as construction parts and sometimes as spring-energized sealing parts as well.

Material availability restrictions

- Thermoplastic elastomers up to ø 4.000 mm
- Rubber materials or elastomers up to ø 1.500 mm
- Plastomers & PTFE materials up to ø 2.000 mm

Standard range of food compliant materials

Food industry

Economos® products are well known and are specified by many of the leading companies in many different industries worldwide and are renowned for their longevity and ability to outperform traditional seals. These factors are becoming more and more appreciated in the food and beverage industry, where the trend is for increased productivity, less downtime and better hygiene.

Supplying a wide range of applications in the food and beverage industry, including many in the bottling, canning and food machinery sector, our global experience is at our customers' command. Wherever seals and seal components are required Economos® can provide Quality Sealing Solutions on time.

Food and pharmaceutical compliant materials

H-ECOPUR (red)
H-ECOPUR (blue)
H-ECOPUR-95A-NC (white/natural)
ECORUBBER-H-85A-B-FG (black)
ECORUBBER 2-85A-W-FG (white)
ECORUBBER 3-85A-W-FG (white)
ECORUBBER 3-85A-B-FG (black)
ECOSIL (reddish brown)
ECOFLON 1 (white)
ECOPE (white/natural)
ECOPAEK (cream)
others upon request

Typical applications

Suction cups, Can flange seals, Guide bushes, Valve stem packings, Bottle top seals, Rollers, Pump packings, O-rings, Centre column seals, Filling head seals, Pneumatic U-cups, Depositor seals, Distributor seals, Pigging seals, Ball valve seats, Seal kits etc...

Material science

Material science is an Economos® strength. For instance, our world class polyurethane H-Ecopur is not only FDA, NSF & KTW compliant, but is also resistant to hot water, caustic solutions and just about anything else found in the food and beverage industry. This material outperforms conventional materials in most applications, particularly depositor seals and filling head seals.

Injection moulding

In the late 90´s Economos started to work also with injection-moulding of seals in a conventional manner and therefore we are a well qualifyed partner, able to supply sealing solutions from a single piece up to thousands and more.

Material development

The in-house research centre and excellent human resources in material science enables Economos to offer individual material development for specific customer needs or special projects.

Test- & simulation facilities

Years of experience in dynamic and static sealing solutions in connection with the use of modern finite element analysis programs (FEA) for non-linear material behaviour became an important tool to optimize seal profiles, resulting in excellent sealing characteristics for all pressure ranges and reliable performance.
The state-of-the-art test rigs at Economos R&D centre support practical experience for both, linear and rotary movement of seals.

Notes for large diameter seals

Polyurethane materials:
Please note, that seals with a diameter of more than 600 mm are made of G-ECOPUR (as a substitute for ECOPUR or H-ECOPUR).
Rubber materials:
The whole elastomer material range (ECORUBBER 1/2/3/H, ECOFLAS, ECOSIL) can be offered now with outer diameters up to 1550 mm.

General terms and conditions

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 60°C and a maximum metal extrusion gap of 0,25 mm. The speed limits apply for adequate lubrication and running surface finishes as recommended.

Due to the many variable conditions to achieve sealing solutions Economos also recommends that material / media compatibility and sealing function be tested for targeted performance under actual field conditions.
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 the nearest Economos Branch or Subsidiary.

This brochure is for information purposes only and cannot substitute individual consultation. The information is based on many years of experience, on FEA-calculations and test results. As far as we can assess this information is the most updated and according to the highest technical standard currently available. However, Economos cannot guarantee and/or take any responsibility, obligation or liability whatsoever in connection with this information. In particular, Economos is not liable for damages or losses that occur in connection with the use or implementation of this information. Warranties for special features, certain aim and utility are subject to a separate agreement.

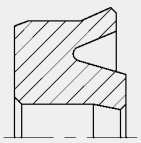
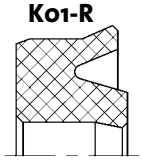
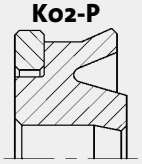
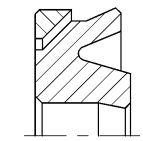
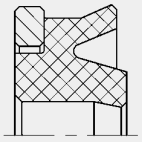
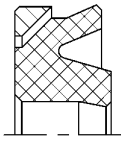
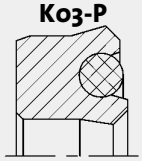
Material data

			Polyurethanes					
properties	DIN-standard	unit	Ecopur TPU	H-Ecopur TPU	G-Ecopur CPU	T-Ecopur TPU	S-Ecopur TPU	Ecorubber 1 NBR
colour			green	red	red	blue	grey	black
hardness	53505	Shore A	95±2	95±2	95±2	95±2	95±2	85±5
hardness	53505	Shore D	48±3	48±3	47±3	48±3	48±3	
density	53479	g/cm³	1,20	1,20	1,20	1,17	1,24	1,31
100% modulus	53504	N/mm²	≥12	≥13	≥11	≥12	17	≥11
tensile strength / yield stress	53504 / 53455	N/mm²	≥40	≥50	≥45	≥50	50	≥16
elongation at break	53504 / 53455	%	≥430	≥330	≥280	≥450	380	≥130
modulus of elasticity – tensile test	53457	N/mm²						
compression set 70°C/24h 20%Def.		%	≤30	≤27	≤30	≤27	25	
100°C/24h 20%Def.		%	≤35	≤33	≤40	≤33	30	
100°C /22h	53517	%						≤15
175°C /24h	53517	%						
rebound resilience	52512	%	42	29	43	50		28
tear strength	53515	N/mm	≥100	≥100	≥40	≥80	120	20
abrasion	53516	mm³	18	17	25	15	17	90
minimum service temperature		°C	-30	-20	-30	-50	-20	-30
maximum service temperature		°C	+110	+110	+110	+110	+110	+100

Rubber Elastomers				Thermoplastics						
Ecorubber-H H-NBR	Ecorubber 2 FPM, FKM	Ecorubber 3 EPDM	Ecosil MVQ	Ecotal POM	Ecoflon 1 PTFE virgin	Ecoflon 2 PTFE +15%GF +5%MoS_2	Ecoflon 3 PTFE +40%Bronze	Ecoflon 4 PTFE +25%Carbon	Ecomid PA	Ecopaek PEEK
black	brown	black	reddish brown	black	white	grey	brown	black	black	cream
85±5	83±5	85±5	85±5							
				82	57	60	64	65	77	86
1,22	2,30	1,22	1,52	1,41	2,17	2,25	3,00	2,10	1,15	1,32
≥10	≥5	≥9	≥5							
≥18	≥8	≥12	≥7	62	27	18	22	15	65	97
≥180	≥200	≥110	≥130	40	300	200	280	180	120	≥50
				2600					1800	3600
≤22	≤20	≤15	≤15							
29	7	38	44							
30	21	15	8							
90	150	120								
-25	-20	-50	-60	-50	-200	-200	-200	-200	-40	
+150	+200	+150	+200	+100	+260	+260	+260	+260	+100	260

Datas of other materials such as S-ECOPUR-57D, ECOFLAS, ECOTEX, ECOPE, low temperature ECORUBBER-H-85A-b-LT, special food grade materials etc. available on request.

Piston seals

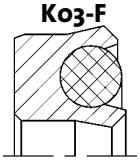
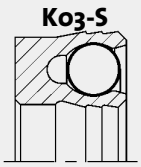
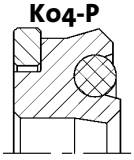
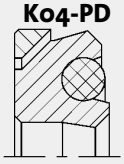
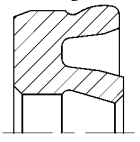
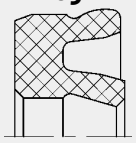
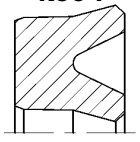
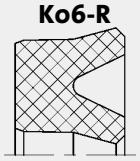
Application	Profile	Description	Temperature	max.speed	max. Pressure	Material	
	Ko1-P 	**hydraulic, single acting** asymmetric piston seal for standard applications. design provides stable fit in the housing, ultimate sealing effect over a wide temperature range. avoids extensive drag pressure. back-to-back arrangement with guide ring in between or for double acting pistons or to separate different fluids.	-30 °C ... +110 °C	0,5 m/s	400 bar (5800 psi)	ECOPUR	
			-20 °C ... +110 °C	0,5 m/s	400 bar (5800 psi)	H-ECOPUR	
			-20 °C ... +110 °C	0,7 m/s	400 bar (5800 psi)	S-ECOPUR	
			-50 °C ... +110 °C	0,5 m/s	400 bar (5800 psi)	T-ECOPUR	
			-30 °C ... +110 °C	0,5 m/s	400 bar (5800 psi)	G-ECOPUR	
	Ko1-R 	**hydraulic, single acting** as profile Ko1-P, but more adaptation possibilities for diverse temperatures and media by selection of suitable seal material.	-30 °C ... +100 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER 1	
			-20 °C ... +200 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER 2	
			-50 °C ... +150 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER 3**	
			-25 °C ... +150 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER-H	
			-60 °C ... +200 °C	-	-	ECOSIL	
	Ko2-P 	**hydraulic, single acting** asymmetric piston seal for standard applications as Ko1-P, but due to design with active back-up ring suitable for higher pressure range or larger extrusion gaps. Ko2-P for standard housing design.				Seal part	Back-up ring
			-30 °C ... +100 °C	0,5 m/s	700 bar (10.000 psi)	ECOPUR	ECOTAL/ ECOMID*
			-20 °C ... +100 °C	0,5 m/s	700 bar (10.000 psi)	H-ECOPUR	
			-20 °C ... +100 °C	0,7 m/s	700 bar (10.000 psi)	S-ECOPUR	
			-40 °C ... +100 °C	0,5 m/s	700 bar (10.000 psi)	T-ECOPUR	
			-30 °C ... +100 °C	0,5 m/s	700 bar (10.000 psi)	G-ECOPUR	
	Ko2-PD 	**hydraulic, single acting** asymmetric piston seal for standard applications as Ko1-P, but due to design with active back-up ring suitable for higher pressure or larger extrusion gaps. Ko2-PD for short housings.				Seal part	Back-up ring
			-30 °C ... +100 °C	0,5 m/s	700 bar (10.000 psi)	ECOPUR	ECOTAL/ ECOMID*
			-20 °C ... +100 °C	0,5 m/s	700 bar (10.000 psi)	H-ECOPUR	
			-20 °C ... +100 °C	0,7 m/s	700 bar (10.000 psi)	S-ECOPUR	
			-40 °C ... +100 °C	0,5 m/s	700 bar (10.000 psi)	T-ECOPUR	
			-30 °C ... +100 °C	0,5 m/s	700 bar (10.000 psi)	G-ECOPUR	
	Ko2-R 	**hydraulic, single acting** as profile Ko2-P, but more adaptation possibilities to diverse temperatures and media by selection of suitable seal material. Ko2-R for standard housing design.				Seal part	Back-up ring
			-30 °C ... +100 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER 1	ECOTAL
			-30 °C ... +100 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER 1	ECOMID*
			-20 °C ... +200 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER 2	ECOFLON II
			-50 °C ... +100 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER 3**	ECOTAL
			-40 °C ... +100 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER 3**	ECOMID*
			-50 °C ... +150 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER 3**	ECOFLON II
			-25 °C ... +100 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER-H	ECOTAL
			-25 °C ... +100 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER-H	ECOMID*
			-25 °C ... +150 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER-H	ECOFLON II
	Ko2-RD 	**hydraulic, single acting** as profile Ko2-P, but more adaptation possibilities to diverse temperatures and media by selection of suitable seal material. Ko2-RD for short housings.				Seal part	Back-up ring
			-30 °C ... +100 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER 1	ECOTAL
			-30 °C ... +100 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER 1	ECOMID*
			-20 °C ... +200 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER 2	ECOFLON II
			-50 °C ... +100 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER 3**	ECOTAL
			-40 °C ... +100 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER 3**	ECOMID*
			-50 °C ... +150 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER 3**	ECOFLON II
			-25 °C ... +100 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER-H	ECOTAL
			-25 °C ... +100 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER-H	ECOMID*
			-25 °C ... +150 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER-H	ECOFLON II
	Ko3-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...)				Seal part	O ring
			-30 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	ECOPUR	NBR (70 Sh A)
			-20 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	H-ECOPUR	NBR (70 Sh A)
			-30 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	T-ECOPUR	NBR (70 Sh A)
			-20 °C ... +100 °C	0,7 m/s	400 bar (5800 psi)	S-ECOPUR	NBR (70 Sh A)
			-30 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	G-ECOPUR	NBR (70 Sh A)
			-50 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	T-ECOPUR	MVQ 70 / ECOSIL

linear moving rotating oscillating spiral moving static

Not bolded symbols: please consult our technical dpmt. for application limitations

* ECOTAL up to ø260 mm, ECOMID above ø260 mm
** attention: not suitable for mineral oils !

# of profiles

Application	Profile	Description	Temperature	max.speed	max. Pressure	Material		
	K03-F	**PTFE-piston seal, single acting** O-Ring activated, asymmetrical PTFE piston seal, low friction and no stick-slip effect. good 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.				Seal part	O-Ring	
			-20 °C ... +200 °C	1 m/s	100 bar (1450 psi)	ECOFLON 1	FPM/FKM (75 Sh A)	
			-20 °C ... +200 °C	1 m/s	160 bar (2300 psi)	ECOFLON 2	FPM/FKM (75 Sh A)	
			-25 °C ... +150 °C	1 m/s	100 bar (1450 psi)	ECOFLON 1	ECORUBBER-H	
			-25 °C ... +150 °C	1 m/s	160 bar (2300 psi)	ECOFLON 2	ECORUBBER-H	
			-60 °C ... +80 °C	0,5 m/s	200 bar (2900 psi)	ECOPE	MVQ 70 / ECOSIL	
			-60 °C ... +200 °C	1 m/s	100 bar (1450 psi)	ECOFLON 1	MVQ 70 / ECOSIL	
			-60 °C ... +200 °C	1 m/s	160 bar (2300 psi)	ECOFLON 2	MVQ 70 / ECOSIL	
	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.				Seal part	Spring	
			-200 °C ...+260 °C	1 m/s	100 bar (1450 psi)	ECOFLON 1	1.4310	
			-200 °C ...+260 °C	1 m/s	160 bar (2300 psi)	ECOFLON 2	1.4310	
			-200 °C ...+ 80 °C	0,5 m/s	200 bar (2900 psi)	ECOPE	1.4310	
	K04-P	**hydraulic, single acting** asymmetric piston seal for standard applications as K03-P, but due to design with active back-up ring suitable for larger extrusion gaps or higher pressure. K04-P for standard housing design				Seal part	O-ring	Back-up
			-30 °C ... +100 °C	0,5 m/s	700 bar (10.000 psi)	ECOPUR	NBR (70 Sh.A)	ECOTAL/ ECOMID*
			-20 °C ... +100 °C	0,5 m/s	700 bar (10.000 psi)	H-ECOPUR		
			-30 °C ... +100 °C	0,5 m/s	700 bar (10.000 psi)	T-ECOPUR		
			-20 °C ... +100 °C	0,7 m/s	700 bar (10.000 psi)	S-ECOPUR		
			-30 °C ... +100 °C	0,5 m/s	700 bar (10.000 psi)	G-ECOPUR		
	K04-PD	**hydraulic, single acting** asymmetric piston seal for standard applications as K03-P, but due to design with active back-up ring suitable for larger extrusion gaps. K04-PD for short housings				Seal part	O-ring	Back-up
			-30 °C ... +100 °C	0,5 m/s	700 bar (10.000 psi)	ECOPUR	NBR (70 Sh.A)	ECOTAL/ ECOMID*
			-20 °C ... +100 °C	0,5 m/s	700 bar (10.000 psi)	H-ECOPUR		
			-30 °C ... +100 °C	0,5 m/s	700 bar (10.000 psi)	T-ECOPUR		
			-20 °C ... +100 °C	0,7 m/s	700 bar (10.000 psi)	S-ECOPUR		
			-30 °C ... +100 °C	0,5 m/s	700 bar (10.000 psi)	G-ECOPUR		
	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.						
			-30 °C ... +110 °C	1 m/s	25 bar (360 psi)	ECOPUR		
			-20 °C ... +110 °C	1 m/s	25 bar (360 psi)	H-ECOPUR		
			-20 °C ... +110 °C	2 m/s	25 bar (360 psi)	S-ECOPUR		
			-50 °C ... +110 °C	1 m/s	25 bar (360 psi)	T-ECOPUR		
			-30 °C ... +110 °C	1 m/s	25 bar (360 psi)	G-ECOPUR		
	K05-R	**pneumatic, single acting** asymmetric piston seal, good wear resistant, for use in lubricated or dry pneumatic applications. good adaptation possibilities for diverse temperatures and media by selection of suitable seal material. special design of sealing lip allows retention of initial lubricating film.						
			-30 °C ... + 80 °C	1 m/s	25 bar (360 psi)	ECORUBBER 1		
			-20 °C ... +200 °C	1 m/s	25 bar (360 psi)	ECORUBBER 2		
			-50 °C ... +150 °C	1 m/s	25 bar (360 psi)	ECORUBBER 3**		
			-25 °C ... +150 °C	1 m/s	25 bar (360 psi)	ECORUBBER-H		
	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.						
			-30 °C ... +110 °C	0,5 m/s	400 bar (5800 psi)	ECOPUR		
			-20 °C ... +110 °C	0,5 m/s	400 bar (5800 psi)	H-ECOPUR		
			-20 °C ... +110 °C	0,7 m/s	400 bar (5800 psi)	S-ECOPUR		
			-50 °C ... +110 °C	0,5 m/s	400 bar (5800 psi)	T-ECOPUR		
			-30 °C ... +110 °C	0,5 m/s	400 bar (5800 psi)	G-ECOPUR		
	K06-R	**hydraulic, single acting** as profile K06-P, but more adaptation possibilities for diverse temperatures and media by selection of suitable seal material. also for larger cross section, easier to install.						
			-30 °C ... +100 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER 1		
			-20 °C ... +200 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER 2		
			-50 °C ... +150 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER 3**		
			-25 °C ... +150 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER-H		
			-60 °C .. +200 °C	-	-	ECOSIL		

linear moving | rotating | oscillating | spiral moving | static

Not bolded symbols: please consult our technical dpmt. for application limitations

* ECOTAL up to ø260 mm, ECOMID above ø260 mm

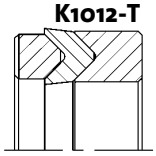
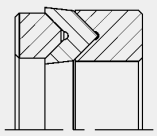
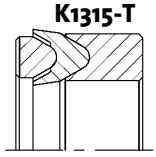
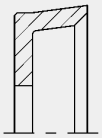
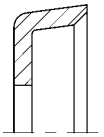
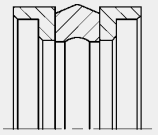
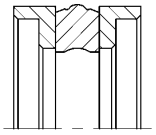
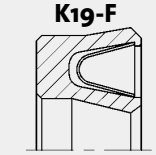
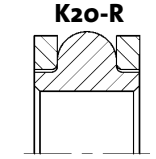
** attention: not suitable for mineral oils !

Application	Profile	Description	Temperature	max.speed	max. Pressure	Material		
	Ko7-P	**hydraulic, single acting** O-Ring activated symmetric piston seal for simple standard applications, not recommended for new designs (profile Ko3-P preferred)				Seal part	O-ring	
			-30 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	ECOPUR	NBR (70 Sh.A)	
			-20 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	H-ECOPUR		
			-20 °C ... +100 °C	0,7 m/s	400 bar (5800 psi)	S-ECOPUR		
			-30 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	T-ECOPUR		
			-30 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	G-ECOPUR		
	Ko8-E	**hydraulic, single acting** O-Ring activated asymmetric PTFE piston seal, low friction. for extreme low or high speed. suitable for positioning functions.				Glide ring	O-ring	
			-30 °C ... +100 °C	10 m/s	400 bar (5800 psi)	ECOFLON 2/3/4	NBR (70 Sh.A)	
			-20 °C ... +200 °C	10 m/s	400 bar (5800 psi)		FPM/FKM (75)	
			-50 °C ... +150 °C	10 m/s	400 bar (5800 psi)		EPDM (70)**	
			-60 °C ... +200 °C	10 m/s	400 bar (5800 psi)		MVQ (70)	
			-60 °C ... +80 °C	10 m/s	400 bar (5800 psi)	ECOPE	MVQ 70 / ECOSIL	
	Ko8-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.				Glide ring	O-ring	
			-30 °C ... +100 °C	10 m/s	400 bar (5800 psi)	ECOFLON 2/3/4	NBR (70 Sh.A)	
			-20 °C ... +200 °C	10 m/s	400 bar (5800 psi)		FPM/FKM (75)	
			-50 °C ... +150 °C	10 m/s	400 bar (5800 psi)		EPDM (70)**	
			-60 °C ... +200 °C	10 m/s	400 bar (5800 psi)		MVQ (70)	
			-60 °C ... +80 °C	10 m/s	400 bar (5800 psi)	ECOPE	MVQ 70 / ECOSIL	
	Ko8-P	**hydraulic, double acting** O-Ring activated symmetric PU piston seal with excellent static and dynamic sealing capacity, extremely wear resistant.				Glide ring	O-ring	
			-30 °C ... +100 °C	1 m/s	250 bar (3600 psi)	ECOPUR	NBR 70Sh.A	
			-20 °C ... +100 °C	1 m/s	250 bar (3600 psi)	H-ECOPUR	NBR 70Sh.A	
			-20 °C ... +100 °C	1,4 m/s	250 bar (3600 psi)	S-ECOPUR	NBR 70Sh.A	
			-30 °C ... +100 °C	1 m/s	250 bar (3600 psi)	T-ECOPUR	NBR 70Sh.A	
	Ko8-ES	**hydraulic, single acting** profile ring-activated asymmetric PTFE piston seal, similar to Ko8-E, but special heavy duty design. for heavy industry hydraulics or for special housing dimensions.				Glide ring	Energizer	
			-30 °C ... +100 °C	10 m/s	400 bar (5800 psi)	ECOFLON 2, 3, 4	ECORUBBER 1	
			-20 °C ... +200 °C	10 m/s	400 bar (5800 psi)	ECOFLON 2, 3, 4	ECORUBBER 2	
			-50 °C ... +150 °C	10 m/s	400 bar (5800 psi)	ECOFLON 2, 3, 4	ECORUBBER 3**	
			-25 °C ... +150 °C	10 m/s	400 bar (5800 psi)	ECOFLON 2, 3, 4	ECORUBBER-H	
	Ko8-DS	**hydraulic, double acting** profile ring-activated symmetric PTFE piston seal, similar to So9-D, but special heavy duty design. for heavy industry hydraulics or for special housing dimensions.				Glide ring	Energizer	
			-30 °C ... +100 °C	10 m/s	400 bar (5800 psi)	ECOFLON 2, 3, 4	ECORUBBER 1	
			-20 °C ... +200 °C	10 m/s	400 bar (5800 psi)	ECOFLON 2, 3, 4	ECORUBBER 2	
			-50 °C ... +150 °C	10 m/s	400 bar (5800 psi)	ECOFLON 2, 3, 4	ECORUBBER 3**	
			-25 °C ... +150 °C	10 m/s	400 bar (5800 psi)	ECOFLON 2, 3, 4	ECORUBBER-H	
	Ko9-N	**hydraulic, double acting** profile ring-activated compact piston seal with integrated guiding elements. excellent static sealing capacity. commonly used in standard cylinders.				Seal	Energizer	Back-up ring
			-30 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	ECOPUR	ECO-RUBBER 1	ECOTAL / ECOMID*
			-20 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	H-ECOPUR		
			-30 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	T-ECOPUR		
			-20 °C ... +100 °C	0,7 m/s	400 bar (5800 psi)	S-ECOPUR		
			-30 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	G-ECOPUR		
	Ko9-D	**hydraulic, double acting** profile ring-activated compact piston seal with integrated guiding elements. excellent static and dynamic sealing capacity.				Seal	Energizer	Back-up ring
			-30 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	ECOPUR	ECO-RUBBER 1	ECOTAL / ECOMID*
			-20 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	H-ECOPUR		
			-30 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	T-ECOPUR		
			-20 °C ... +100 °C	0,7 m/s	400 bar (5800 psi)	S-ECOPUR		
			-30 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	G-ECOPUR		
	Ko9-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.				Seal	Energizer	Back-up ring
			-20 °C ... +100 °C	0,3 m/s	1500 bar (21700 psi)	H-ECOPUR	ECO-RUBBER 1	ECOTAL / ECOMID*
			-30 °C ... +100 °C	0,3 m/s	1500 bar (21700 psi)	G-ECOPUR		
	Ko9-F	**hydraulic, double acting** profile ring-activated compact PTFE piston seal with integrated guiding elements. low friction, good chemical and thermal resistance.				Seal	Energizer	Back-up ring
			-30 °C ... +100 °C	1,5 m/s	500 bar (7200 psi)	ECOFLON 2	ECO-RUBBER 1	ECOTAL
			-30 °C ... +100 °C	1,5 m/s	500 bar (7200 psi)	ECOFLON 2		ECOMID
			-20 °C ... +200 °C	1,5 m/s	400 bar (5800 psi)	ECOFLON 2	ECO-RUBBER 2	ECOPAEK
			-20 °C ... +200 °C	1,5 m/s	400 bar (5800 psi)	ECOFLON 2		ECOFLON 4

linear moving rotating oscillating spiral moving static

Not bolded symbols: please consult our technical dpmt. for application limitations

* ECOTAL up to ø260 mm, ECOMID above ø260 mm
** attention: not suitable for mineral oils !

Application	Profile	Description	Temperature	max.speed	max. Pressure	Material		
	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.				K 10-A	K 11-T	K 12-T
			-30 °C ... +100 °C	0,5 m/s	500 bar (7200 psi)	ECOTAL ECOMID*	ECOPUR H-ECOPUR T-ECOPUR S-ECOPUR	ECOTAL ECOMID*
			-20 °C ... +100 °C	0,5 m/s	500 bar (7200 psi)			
			-40 °C ... +100 °C	0,5 m/s	500 bar (7200 psi)			
			-20 °C ... +100 °C	0,7 m/s	500 bar (7200 psi)			
			-30 °C ... +100 °C	0,5 m/s	250 bar (3600 psi)	ECO- FLON 2	ECORUBBER1 ECORUBBER2 ECORUBBER3 ECORUBBER-H	ECO- FLON 2
			-20 °C ... +200 °C	0,5 m/s	250 bar (3600 psi)			
			-50 °C ... +150 °C	0,5 m/s	250 bar (3600 psi)			
			-25 °C ... +150 °C	0,5 m/s	250 bar (3600 psi)			
	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.				K 10-A	K 11-T	K 12-T
			-30 °C ... +100 °C	0,5 m/s	500 bar (7200 psi)	ECOTAL ECOMID*	ECOPUR H-ECOPUR T-ECOPUR S-ECOPUR	ECOTAL ECOMID*
			-20 °C ... +100 °C	0,5 m/s	500 bar (7200 psi)			
			-40 °C ... +100 °C	0,5 m/s	500 bar (7200 psi)			
			-20 °C ... +100 °C	0,7 m/s	500 bar (7200 psi)			
			-30 °C ... +100 °C	0,5 m/s	250 bar (3600 psi)	ECO- FLON 2	ECORUBBER1 ECORUBBER2 ECORUBBER3 ECORUBBER-H	ECO- FLON 2
			-20 °C ... +200 °C	0,5 m/s	250 bar (3600 psi)			
			-50 °C ... +150 °C	0,5 m/s	250 bar (3600 psi)			
			-25 °C ... +150 °C	0,5 m/s	250 bar (3600 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				K 13-T	K 14-T	K 15-T
			-30 °C ... +100 °C	0,5 m/s	600 bar (8700 psi)	ECOTAL ECOMID*	ECOPUR H-ECOPUR T-ECOPUR S-ECOPUR	ECOTAL ECOMID*
			-20 °C ... +100 °C	0,5 m/s	600 bar (8700 psi)			
			-40 °C ... +100 °C	0,5 m/s	600 bar (8700 psi)			
			-20 °C ... +100 °C	0,7 m/s	600 bar (8700 psi)			
	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.						
			-30 °C ... +110 °C	0,5 m/s	160 bar (2300 psi)	ECOPUR		
			-20 °C ... +110 °C	0,5 m/s	160 bar (2300 psi)	H-ECOPUR		
			-50 °C ... +110 °C	0,5 m/s	160 bar (2300 psi)	T-ECOPUR		
			-20 °C ... +110 °C	0,7 m/s	160 bar (2300 psi)	S-ECOPUR		
			-30 °C ... +110 °C	0,5 m/s	160 bar (2300 psi)	G-ECOPUR		
			-30 °C ... +100 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER 1		
			-25 °C ... +150 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER-H		
			-20 °C ... +200 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER 2		
			-50 °C ... +150 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER 3		
	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.						
			-30 °C ... +110 °C	0,5 m/s	160 bar (2300 psi)	ECOPUR		
			-20 °C ... +110 °C	0,5 m/s	160 bar (2300 psi)	H-ECOPUR		
			-50 °C ... +110 °C	0,5 m/s	160 bar (2300 psi)	T-ECOPUR		
			-20 °C ... +110 °C	0,7 m/s	160 bar (2300 psi)	S-ECOPUR		
			-30 °C ... +110 °C	0,5 m/s	160 bar (2300 psi)	G-ECOPUR		
			-30 °C ... +100 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER 1		
			-25 °C ... +150 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER-H		
			-20 °C ... +200 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER 2		
			-50 °C ... +150 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER 3		
	K17-P	**hydraulic, double acting** space saving, compact piston seal with integrated guiding elements. excellent static sealing capacity, suitable for small housings.				Seal part	Back-up ring	
			-30 °C ... +100 °C	0,5 m/s	250 bar (3600 psi)	ECOPUR	ECOTAL ECOMID*	
			-20 °C ... +100 °C	0,5 m/s	250 bar (3600 psi)	H-ECOPUR		
			-40 °C ... +100 °C	0,5 m/s	250 bar (3600 psi)	T-ECOPUR		
			-20 °C ... +100 °C	0,7 m/s	250 bar (3600 psi)	S-ECOPUR		
	K17-R	**hydraulic, single acting** space saving, compact piston seal with integrated guiding elements. excellent static sealing capacity, good adaptation possibilities for diverse temperatures and media by selection of suitable material. suitable for small housings.				Seal part	Back-up ring	
			-30 °C ... +100 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER 1	ECOTAL	
			-30 °C ... +100 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER 1	ECOMID*	
			-20 °C ... +200 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER 2	ECOFLON 2	
			-20 °C ... +200 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER 2	ECOPAEK	
	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.				Seal part	Spring	
			-200 °C ... +260 °C	15 m/s	100 bar (1450 psi)	ECOFLON 1	1.4310	
			-200 °C ... +260 °C	15 m/s	160 bar (2300 psi)	ECOFLON 2	1.4310	
			-200 °C ... +260 °C	15 m/s	160 bar (2300 psi)	ECOFLON 3	1.4310	
			-200 °C ... +80 °C	15 m/s	200 bar (2900 psi)	ECOPE	1.4310	
	K20-R	**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, design with interference fit on outside diameter prevents twisting in dynamic applications.				Seal part	Back-up ring	
			-30 °C ... +100 °C	0,5 m/s	700 bar (10.000 psi)	ECORUBBER 1	ECOTAL ECOMID* ECOPAEK ECOFLON	
			-25 °C ... +100 °C	0,5 m/s	700 bar (10.000 psi)	ECORUBBER-H		
			-20 °C ... +200 °C	0,5 m/s	700 bar (10.000 psi)	ECORUBBER 2		
			-25 °C ... +150 °C	0,5 m/s	700 bar (10.000 psi)	ECORUBBER-H		

linear moving rotating oscillating spiral moving static

* ECOTAL up to ø260 mm, ECOMID above ø260 mm

Not bolded symbols: please consult our technical dpmt. for application limitations

Application	Profile	Description	Temperature	max.speed	max. Pressure	Material		
	K21-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).				Seal part	O-ring	
			-30 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	ECOPUR	NBR 70 Sh.A	
			-20 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	H-ECOPUR	NBR 70 Sh.A	
			-30 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	T-ECOPUR	NBR 70 Sh.A	
			-20 °C ... +100 °C	0,7 m/s	400 bar (5800 psi)	S-ECOPUR	NBR 70 Sh.A	
			-30 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	G-ECOPUR	NBR 70 Sh.A	
	K22-P	**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 in angled design possible.				Seal part	Support ring	
			-30 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	ECOPUR	ECOTAL/ ECOMID*	
			-20 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	H-ECOPUR		
			-40 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	T-ECOPUR		
			-20 °C ... +100 °C	0,7 m/s	400 bar (5800 psi)	S-ECOPUR		
			-30 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	G-ECOPUR		
	K22-R	**hydraulic, single acting** symmetric piston seal as K22-P, but more adaptation possibilities for diverse temperatures and media by selection of suitable seal material.. retainer ring in angled design possible.				Seal part	Support ring	
			-30 °C ... +100 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER 1	ECOTAL	
			-30 °C ... +100 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER 1	ECOMID	
			-20 °C ... +200 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER 2	ECOFLON 2	
			-50 °C ... +100 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER 3**	ECOTAL	
			-40 °C ... +100 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER 3**	ECOMID	
			-50 °C ... +150 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER 3**	ECOFLON 2	
			-25 °C ... +100 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER-H	ECOTAL	
			-25 °C ... +100 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER-H	ECOMID	
			-25 °C ... +150 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER-H	ECOFLON 2	
	K23-N	**hydraulic, double acting** profile ring-activated compact piston seal with integrated back-up rings, excellent static sealing capacity. external guiding elements required.				Seal	Energizer	Back-up ring
			-30 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	ECOPUR	ECO-RUBBER 1	ECOTAL/ ECOMID*
			-20 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	H-ECOPUR		
			-30 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	T-ECOPUR		
			-20 °C ... +100 °C	0,7 m/s	400 bar (5800 psi)	S-ECOPUR		
			-30 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	G-ECOPUR		
	K23-D	**hydraulic, double acting** profile ring-activated compact piston seal with integrated back-up rings. excellent static and dynamic sealing capacity. external guiding elements required.				Seal	Energizer	Back-up ring
			-30 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	ECOPUR	ECO-RUBBER 1	ECOTAL / ECOMID*
			-20 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	H-ECOPUR		
			-30 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	T-ECOPUR		
			-20 °C ... +100 °C	0,7 m/s	400 bar (5800 psi)	S-ECOPUR		
			-30 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	G-ECOPUR		
	K23-H	**hydraulic, double acting** profile ring-activated compact piston seal with integrated back-up rings. design for high pressure range, excellent static sealing capacity. mainly used in mining / tunneling industry. external guiding elements required.				Seal	Energizer	Back-up ring
			-20 °C ... +100 °C	0,3 m/s	1500 bar (21000 psi)	H-ECOPUR	ECO-RUBBER 1	ECOTAL / ECOMID*
			-30 °C ... +100 °C	0,3 m/s	1500 bar (21000 psi)	G-ECOPUR		
	K23-F	**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.				Seal	Energizer	Back-up ring
			-30 °C ... +100 °C	1,5 m/s	500 bar (7200 psi)	ECOFLON 2	ECO-RUBBER 1	ECOTAL
			-30 °C ... +100 °C	1,5 m/s	500 bar (7200 psi)	ECOFLON 2		ECOMID
			-20 °C ... +200 °C	1,5 m/s	400 bar (5800 psi)	ECOFLON 2	ECO-RUBBER 2	ECOPAEK
			-20 °C ... +200 °C	1,5 m/s	400 bar (5800 psi)	ECOFLON 2		ECOFLON 4
			-20 °C ... +200 °C	1,5 m/s	400 bar (5800 psi)	ECOFLON 4		ECOFLON 4
	K24-P	**hydraulic, single acting** chevron ring with flexible lip design. replacement part for standard commercial housings (male and female adapter mainly made of metal).				Seal		
			-30 °C ... +110 °C	0,5 m/s	500 bar (7200 psi)	ECOPUR		
			-20 °C ... +110 °C	0,5 m/s	500 bar (7200 psi)	H-ECOPUR		
			-50 °C ... +110 °C	0,5 m/s	500 bar (7200 psi)	T-ECOPUR		
			-20 °C ... +110 °C	0,7 m/s	500 bar (7200 psi)	S-ECOPUR		
			-30 °C ... +110 °C	0,5 m/s	500 bar (7200 psi)	G-ECOPUR		
			-30 °C ... +100 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER 1		
			-20 °C ... +200 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER 2		
			-50 °C ... +150 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER 3**		
			-25 °C ... +150 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER H		
	K32-P	**hydraulic, single acting** chevron sealing set, design 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).				Seal	Collar	Back-up ring
			-30 °C ... +100 °C	0,5 m/s	500 bar (7200 psi)	ECOPUR	ECOTAL / ECOMID*	ECOTAL / ECOMID*
			-20 °C ... +100 °C	0,5 m/s	500 bar (7200 psi)	H-ECOPUR		
			-40 °C ... +100 °C	0,5 m/s	500 bar (7200 psi)	T-ECOPUR		
			-20 °C ... +100 °C	0,7 m/s	500 bar (7200 psi)	S-ECOPUR		
			-30 °C ... +100 °C	0,5 m/s	500 bar (7200 psi)	G-ECOPUR		
	K35-P	**hydraulic, double acting** compact piston seal with almost no dead spots as required for applications in food and pharma industry, also commonly used as O-Ring replacement, because design with interference fit on outside diameter maintains non-twisting in dynamic applications.				Seal part		
			-30 °C ... +110 °C	0,4 m/s	400 bar (5800 psi)	ECOPUR		
			-20 °C ... +110 °C	0,4 m/s	400 bar (5800 psi)	H-ECOPUR		
			-50 °C ... +110 °C	0,4 m/s	400 bar (5800 psi)	T-ECOPUR		
			-20 °C ... +110 °C	0,5 m/s	400 bar (5800 psi)	S-ECOPUR		
			-30 °C ... +110 °C	0,4 m/s	400 bar (5800 psi)	G-ECOPUR		

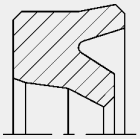
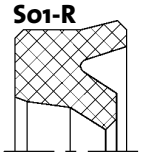
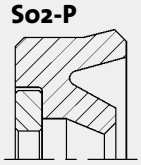
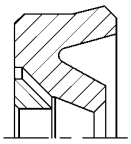
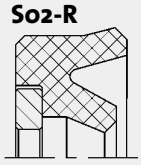
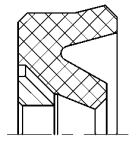
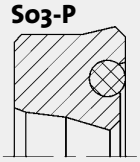
linear moving rotating oscillating spiral moving static

* ECOTAL up to ø260 mm, ECOMID above ø260 mm
** attention: not suitable for mineral oils !

Not bolded symbols: please consult our technical dpmt. for application limitations

Rod seals

Rod sealing line

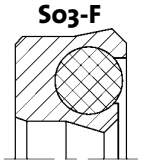
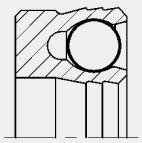
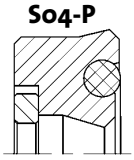
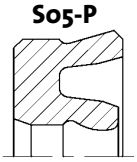
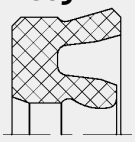
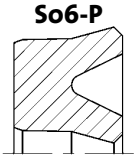
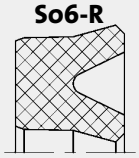
Application	Profile	Description	Temperature	max.speed	max. Pressure	Material	
	S01-P 	**hydraulic, single acting** asymmetric rod seal for standard applications. interference fit on outside diameter maintains stable fit in the housing. design provides ultimate sealing effect over a wide temperature range and good backpumping ability. also used as secondary seal in combination with PTFE-seal type S09.	-30 °C ... +110 °C	0,5 m/s	400 bar (5800 psi)	ECOPUR	
			-20 °C ... +110 °C	0,5 m/s	400 bar (5800 psi)	H-ECOPUR	
			-20 °C ... +110 °C	0,7 m/s	400 bar (5800 psi)	S-ECOPUR	
			-50 °C ... +110 °C	0,5 m/s	400 bar (5800psi)	T-ECOPUR	
			-30 °C ... +110 °C	0,5 m/s	400 bar (5800 psi)	G-ECOPUR	
	S01-R 	**hydraulic, single acting** as profile S01-P, but more adaptation possibilities for diverse temperatures and media by selection of suitable seal material.	-30 °C ... +100 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER 1	
			-20 °C ... +200 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER 2	
			-50 °C ... +150 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER 3**	
			-25 °C ... +150 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER-H	
			-60 °C ... +200 °C	-	-	ECOSIL	
	S02-P 	**hydraulic, single acting** asymmetric rod seal for standard applications as S01-P, but due to design with active back-up ring suitable for larger extrusion gaps or higher pressure range. S02-P for standard housing design				Seal part	Back-up ring
			-30 °C ... +100 °C	0,5 m/s	700 bar (10.000 psi)	ECOPUR	ECOTAL/ ECOMID*
			-20 °C ... +100 °C	0,5 m/s	700 bar (10.000 psi)	H-ECOPUR	
			-20 °C ... +100 °C	0,7 m/s	700 bar (10.000 psi)	S-ECOPUR	
			-40 °C ... +100 °C	0,5 m/s	700 bar (10.000 psi)	T-ECOPUR	
			-30 °C ... +100 °C	0,5 m/s	700 bar (10.000 psi)	G-ECOPUR	
	S02-PD 	**hydraulic, single acting** asymmetric rod seal for standard applications as S01-P, but due to design with active back-up ring suitable for larger extrusion gaps or higher pressure range. S02-PD for short housings				Seal part	Back-up ring
			-30 °C ... +100 °C	0,5 m/s	700 bar (10.000 psi)	ECOPUR	ECOTAL/ ECOMID*
			-20 °C ... +100 °C	0,5 m/s	700 bar (10.000 psi)	H-ECOPUR	
			-20 °C ... +100 °C	0,7 m/s	700 bar (10.000 psi)	S-ECOPUR	
			-40 °C ... +100 °C	0,5 m/s	700 bar (10.000 psi)	T-ECOPUR	
			-30 °C ... +100 °C	0,5 m/s	700 bar (10.000 psi)	G-ECOPUR	
	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				Seal part	Back-up ring
			-30 °C ... +100 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER 1	ECOTAL*
			-30 °C ... +100 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER 1	ECOMID*
			-20 °C ... +200 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER 2	ECOFLON 2
			-50 °C ... +100 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER 3**	ECOTAL*
			-40 °C ... +100 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER 3**	ECOMID*
			-50 °C ... +150 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER 3**	ECOFLON 2
			-25 °C ... +100 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER-H	ECOTAL*
			-25 °C ... +100 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER H	ECOMID*
			-25 °C ... +150 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER H	ECOFLON 2
	S02-RD 	**hydraulic, single acting** as profile S02-P, but more adaptation possibilities for diverse temperatures and media by selection of suitable seal material. S02-RD for short housings				Seal part	Back-up ring
			-30 °C ... +100 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER 1	ECOTAL*
			-30 °C ... +100 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER 1	ECOMID*
			-20 °C ... +200 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER 2	ECOFLON 2
			-50 °C ... +100 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER 3**	ECOTAL*
			-40 °C ... +100 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER 3**	ECOMID*
			-50 °C ... +150 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER 3**	ECOFLON 2
			-25 °C ... +100 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER-H	ECOTAL*
			-25 °C ... +100 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER H	ECOMID*
			-25 °C ... +150 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER H	ECOFLON 2
	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...)				Seal part	O ring
			-30 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	ECOPUR	NBR (70 Sh A)
			-20 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	H-ECOPUR	NBR (70 Sh A)
			-30 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	T-ECOPUR	NBR (70 Sh A)
			-20 °C ... +100 °C	0,7 m/s	400 bar (5800 psi)	S-ECOPUR	NBR (70 Sh A)
			-30 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	G-ECOPUR	NBR (70 Sh A)

linear moving · rotating · oscillating · spiral moving · static

* ECOTAL up to ø260 mm, ECOMID above ø260 mm
** attention: not suitable for mineral oils !

Not bolded symbols: please consult our technical dpmt. for application limitations

rod of profiles

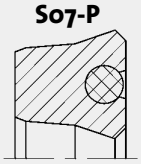
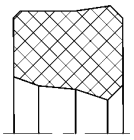
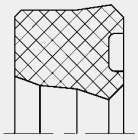
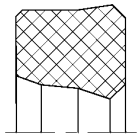
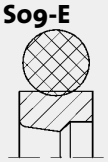
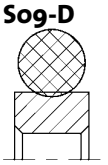
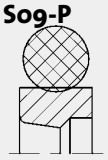
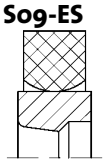
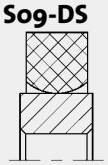
Application	Profile	Description	Temperature	max.speed	max. Pressure	Material		
	S03-F	**PTFE-rodseal, single acting**				Seal part	O-Ring	
		O-Ring activated, asymmetrical PTFE rod seal, low friction, good dry running properties and adaptation possibilities for diverse temperatures and media by selection of suitable O-Ring material, almost no dead spots as required for applications in food & pharma industry.	-20 °C ... +200 °C	1 m/s	100 bar (1450 psi)	ECOFLON 1	FPM/FKM (75 Sh A)	
			-20 °C ... +200 °C	1 m/s	160 bar (2300 psi)	ECOFLON 2	FPM/FKM (75 Sh A)	
			-25 °C ... +150 °C	1 m/s	100 bar (1450 psi)	ECOFLON 1	ECORUBBER-H	
			-25 °C ... +150 °C	1 m/s	160 bar (2300 psi)	ECOFLON 2	ECORUBBER-H	
			-60 °C ... +80 °C	0,5 m/s	200 bar (2900 psi)	ECOPE	MVQ 70 / ECOSIL	
			-60 °C ... +200 °C	1 m/s	100 bar (1450 psi)	ECOFLON 1	MVQ 70 / ECOSIL	
			-60 °C ... +200 °C	1 m/s	160 bar (2300 psi)	ECOFLON 2	MVQ 70 / ECOSIL	
	S03-S	**PTFE-rodseal, single acting**				Seal part	Spring	
		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.	-200 °C ...+260 °C	1 m/s	100 bar (1450 psi)	ECOFLON 1	1.4310	
			-200 °C ...+260 °C	1 m/s	160 bar (2300 psi)	ECOFLON 2	1.4310	
			-200 °C ...+ 80 °C	0,5 m/s	200 bar (2900 psi)	ECOPE	1.4310	
	S04-P	**hydraulic, single acting**				Seal part	O-ring	Back-up
		asymmetric rod seal for standard applications as S03-P, but due to design with active back-up ring suitable for larger extrusion gaps or higher pressure range. S04-P for standard housing design	-30 °C ... +100 °C	0,5 m/s	700 bar (10.000 psi)	ECOPUR	NBR (70 Sh.A)	ECOTAL/ ECOMID*
			-20 °C ... +100 °C	0,5 m/s	700 bar (10.000 psi)	H-ECOPUR		
			-30 °C ... +100 °C	0,5 m/s	700 bar (10.000 psi)	T-ECOPUR		
			-20 °C ... +100 °C	0,7 m/s	700 bar (10.000 psi)	S-ECOPUR		
			-30 °C ... +100 °C	0,5 m/s	700 bar (10.000 psi)	G-ECOPUR		
	S04-PD	**hydraulic, single acting**				Seal part	O-ring	Back-up
		asymmetric rod seal for standard applications as S03-P, but due to design with active back-up ring suitable for larger extrusion gaps or higher pressure range. S04-PD for short housings.	-30 °C ... +100 °C	0,5 m/s	700 bar (10.000 psi)	ECOPUR	NBR (70 Sh.A)	ECOTAL/ ECOMID*
			-20 °C ... +100 °C	0,5 m/s	700 bar (10.000 psi)	H-ECOPUR		
			-30 °C ... +100 °C	0,5 m/s	700 bar (10.000 psi)	T-ECOPUR		
			-20 °C ... +100 °C	0,7 m/s	700 bar (10.000 psi)	S-ECOPUR		
			-30 °C ... +100 °C	0,5 m/s	700 bar (10.000 psi)	G-ECOPUR		
	S05-P	**pneumatic, single acting**						
		asymmetric rod seal, extremely wear resistant, for use in lubricated or dry pneumatic applications. special design of sealing lip allows retention of initial lubricating film.	-30 °C ... +110 °C	1 m/s	25 bar (360 psi)	ECOPUR		
			-20 °C ... +110 °C	1 m/s	25 bar (360 psi)	H-ECOPUR		
			-20 °C ... +110 °C	2 m/s	25 bar (360 psi)	S-ECOPUR		
			-50 °C ... +110 °C	1 m/s	25 bar (360 psi)	T-ECOPUR		
			-30 °C ... +110 °C	1 m/s	25 bar (360 psi)	G-ECOPUR		
	S05-R	**pneumatic, single acting**						
		as profile S05-R, good wear resistance and adaptation possibilities for diverse temperatures and media by selection of suitable seal material. special design of sealing lip allows retention of initial lubricating film.	-30 °C ... +80 °C	1 m/s	25 bar (360 psi)	ECORUBBER 1		
			-20 °C ... +200 °C	1 m/s	25 bar (360 psi)	ECORUBBER 2		
			-50 °C ... +150 °C	1 m/s	25 bar (360 psi)	ECORUBBER 3**		
			-25 °C ... +150 °C	1 m/s	25 bar (360 psi)	ECORUBBER-H		
	S06-P	**hydraulic, single acting**						
		symmetric rod seal for simple standard applications, not recommended for new designs (profile S01-P should be preferred).	-30 °C ... +110 °C	0,5 m/s	400 bar (5800 psi)	ECOPUR		
			-20 °C ... +110 °C	0,5 m/s	400 bar (5800 psi)	H-ECOPUR		
			-20 °C ... +110 °C	0,7 m/s	400 bar (5800 psi)	S-ECOPUR		
			-50 °C ... +110 °C	0,5 m/s	400 bar (5800 psi)	T-ECOPUR		
			-30 °C ... +110 °C	0,5 m/s	400 bar (5800 psi)	G-ECOPUR		
	S06-R	**hydraulic, single acting**						
		as profile S06-P, but more adaptation possibilities for diverse temperatures and media by selection of suitable seal material.	-30 °C ... +100 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER 1		
			-20 °C ... +200 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER 2		
			-50 °C ... +150 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER 3**		
			-25 °C ... +150 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER-H		
			-60 °C ... +200 °C	-	-	ECOSIL		

linear moving rotating oscillating spiral moving static

Not bolded symbols: please consult our technical dpmt. for application limitations

* ECOTAL up to ø260 mm, ECOMID above ø260 mm

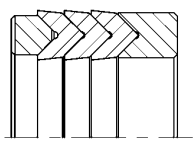
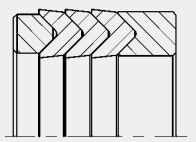
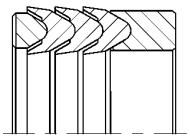
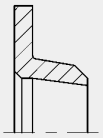
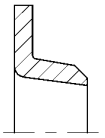
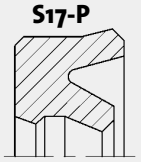
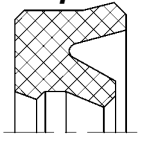
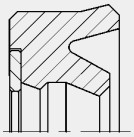
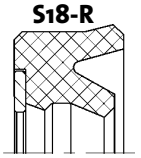
** attention: not suitable for mineral oils !

Application	Profile	Description	Temperature	max.speed	max. Pressure	Material	
						Seal part	O- ring
	So7-P 	**hydraulic, single acting** O-Ring activated symmetric rod seal for simple standard applications, not recommended for new designs (profile So3-P preferred).	-30 °C ... +100 °C	0,5 m/s	400 bar (5800 psi	ECOPUR	NBR (70 Sh.A)
			-20 °C ... +100 °C	0,5 m/s	400 bar (5800 psi	H-ECOPUR	
			-20 °C ... +100 °C	0,7 m/s	400 bar (5800 psi	S-ECOPUR	
			-30 °C ... +100 °C	0,5 m/s	400 bar (5800 psi	T-ECOPUR	
			-30 °C ... +100 °C	0,5 m/s	400 bar (5800 psi	G-ECOPUR	
	So8-P 	**hydraulic, single acting** asymmetric compact rod seal with stable fit in the housing. compact design mainly used to seal high viscosity fluids or for extreme small housings, not suitable for high speed applications. So8-P compact design, no groove	-30 °C ... +110 °C	0,3 m/s	400 bar (5800 psi)	ECOPUR	
			-20 °C ... +110 °C	0,3 m/s	400 bar (5800 psi)	H-ECOPUR	
			-20 °C ... +110 °C	0,4 m/s	400 bar (5800 psi)	S-ECOPUR	
			-50 °C ... +110 °C	0,3 m/s	400 bar (5800 psi)	T-ECOPUR	
			-30 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	G-ECOPUR	
	So8-PE 	**hydraulic, single acting** asymmetric compact rod seal with stable fit in the housing. compact design mainly used to seal high viscosity fluids or for extreme small housings, not suitable for high speed applications. So8-PE with small groove.	-30 °C ... +110 °C	0,3 m/s	400 bar (5800 psi	ECOPUR	
			-20 °C ... +110 °C	0,3 m/s	400 bar (5800 psi	H-ECOPUR	
			-20 °C ... +110 °C	0,4 m/s	400 bar (5800 psi	S-ECOPUR	
			-50 °C ... +110 °C	0,3 m/s	400 bar (5800 psi	T-ECOPUR	
			-30 °C ... +100 °C	0,5 m/s	400 bar (5800 psi	G-ECOPUR	
	So8-R 	**hydraulic, single acting** as profile So8-P, but more adaptation possibilities for diverse temperatures and media by selection of suitable seal material.	-30 °C ... +100 °C	0,3 m/s	160 bar (2300 psi)	ECORUBBER 1	
			-20 °C ... +200 °C	0,3 m/s	160 bar (2300 psi)	ECORUBBER 2	
			-50 °C ... +150 °C	0,3 m/s	160 bar (2300 psi)	ECORUBBER 3**	
			-25 °C ... +150 °C	0,3 m/s	160 bar (2300 psi)	ECORUBBER-H	
						Glide ring	O-ring
	So9-E 	**hydraulic, single acting** O-Ring activated asymmetric PTFE rod seal, low friction. in tandem design together with double acting wipers for extreme low or high speed or positioning functions. as primary seal in combination with secondary So1-P seal with good resistance to pressure shocks used in mobile hydraulics, machine tools, injection moulding machines, heavy hydraulics.	-30 °C ... +100 °C	10 m/s	400 bar (5800 psi)	ECOFLON 2/3/4	NBR (70 Sh.A)
			-20 °C ... +200 °C	10 m/s	400 bar (5800 psi)		FPM/FKM (75)
			-50 °C ... +150 °C	10 m/s	400 bar (5800 psi)		EPDM (70)**
			-60 °C ... +200 °C	10 m/s	400 bar (5800 psi)		MVQ (70)
			-60 °C ... +80 °C	10 m/s	400 bar (5800 psi)	ECOPE	MVQ 70 / ECOSIL
						Glide ring	O-ring
	So9-D 	**hydraulic, double acting** O-Ring activated symmetric PTFE rod seal, low friction. for extreme low or high speed, suitable for positioning functions.	-30 °C ... +100 °C	10 m/s	400 bar (5800 psi)	ECOFLON 2/3/4	NBR (70 Sh.A)
			-20 °C ... +200 °C	10 m/s	400 bar (5800 psi)		FPM/FKM (75)
			-50 °C ... +150 °C	10 m/s	400 bar (5800 psi)		EPDM (70)**
			-60 °C ... +200 °C	10 m/s	400 bar (5800 psi)		MVQ (70)
			-60 °C ... +80 °C	10 m/s	400 bar (5800 psi)	ECOPE	MVQ 70 / ECOSIL
						Glide ring	Energizer
	So9-P 	**hydraulic, single acting** O-Ring activated asymmetric PU rod seal with excellent dynamic sealing capacity. used as secondary seal in tandem design (together with primary So9-E) to minimize residual oil film. for mobile hydraulics, injection moulding machines, heavy hydraulics.	-30 °C ... +100 °C	1 m/s	250 bar (3600 psi)	ECOPUR	NBR (70Sh.A)
			-20 °C ... +100 °C	1 m/s	250 bar (3600 psi)	H-ECOPUR	NBR (70Sh.A)
			-30 °C ... +100 °C	1 m/s	250 bar (3600 psi)	T-ECOPUR	NBR (70Sh.A)
			-20 °C ... +100 °C	1,4 m/s	250 bar (3600 psi)	S-ECOPUR	NBR (70Sh.A)
			-30 °C ... +100 °C	1 m/s	250 bar (3600 psi)	G-ECOPUR	NBR (70Sh.A)
						Glide ring	Energizer
	So9-ES 	**hydraulic, single acting** profile ring-activated asymmetric PTFE rod seal, similar to So9-E, but special heavy duty design for heavy industry hydraulics or for special housing dimensions.	-30 °C ... +100 °C	10 m/s	400 bar (5800 psi)	ECOFLON 2, 3, 4	ECORUBBER 1
			-20 °C ... +200 °C	10 m/s	400 bar (5800 psi)	ECOFLON 2, 3, 4	ECORUBBER 2
			-50 °C ... +150 °C	10 m/s	400 bar (5800 psi)	ECOFLON 2, 3, 4	ECORUBBER 3**
			-25 °C ... +150 °C	10 m/s	400 bar (5800 psi)	ECOFLON 2, 3, 4	ECORUBBER-H
						Glide ring	Energizer
	So9-DS 	**hydraulic, double acting** profile ring-activated symmetric PTFE rod seal, similar to So9-D, but special heavy duty design for heavy industry hydraulics or for special housing dimensions.	-30 °C ... +100 °C	10 m/s	400 bar (5800 psi)	ECOFLON 2, 3, 4	ECORUBBER 1
			-20 °C ... +200 °C	10 m/s	400 bar (5800 psi)	ECOFLON 2, 3, 4	ECORUBBER 2
			-50 °C ... +150 °C	10 m/s	400 bar (5800 psi)	ECOFLON 2, 3, 4	ECORUBBER 3**
			-25 °C ... +150 °C	10 m/s	400 bar (5800 psi)	ECOFLON 2, 3, 4	ECORUBBER-H

linear moving · rotating · oscillating · spiral moving · static

* ECOTAL up to ø260 mm, ECOMID above ø260 mm
** attention: not suitable for mineral oils !

Not bolded symbols: please consult our technical dpmt. for application limitations

Application	Profile	Description	Temperature	max.speed	max. Pressure	Material		
	S1012-M	**hydraulic, single acting** chevron sealing set, parting surface design. for heavy industry hydraulics.				S 10-A	S 11-M	S 12-M
			-30 °C ... +100 °C	0,5 m/s	500 bar (7200 psi)	ECOTAL/ ECOMID*	ECOPUR	ECOTAL/ ECOMID*
			-20 °C ... +100 °C	0,5 m/s	500 bar (7200 psi)		H-ECOPUR	
			-40 °C ... +100 °C	0,5 m/s	500 bar (7200 psi)		T-ECOPUR	
			-20 °C ... +100 °C	0,7 m/s	500 bar (7200 psi)		S-ECOPUR	
			-30 °C ... +100 °C	0,5 m/s	500 bar (7200 psi)		G-ECOPUR	
			-30 °C ... +100 °C	0,5 m/s	250 bar (3600 psi)	ECO-FLON 2	ECORUB. 1	ECO-FLON 2
			-20 °C ... +200 °C	0,5 m/s	250 bar (3600 psi)		ECORUB. 2	
			-50 °C ... +150 °C	0,5 m/s	250 bar (3600 psi)		ECORUB. 3**	
			-25 °C ... +150 °C	0,5 m/s	250 bar (3600 psi)		ECORUB.-H	
	S1012-T	**hydraulic, single acting** chevron sealing set, machined surface design. for heavy industry hydraulics.				S 10-A	S 11-T	S 12-T
			-30 °C ... +100 °C	0,5 m/s	500 bar (7200 psi)	ECOTAL/ ECOMID*	ECOPUR	ECOTAL/ ECOMID*
			-20 °C ... +100 °C	0,5 m/s	500 bar (7200 psi)		H-ECOPUR	
			-40 °C ... +100 °C	0,5 m/s	500 bar (7200 psi)		T-ECOPUR	
			-20 °C ... +100 °C	0,7 m/s	500 bar (7200 psi)		S-ECOPUR	
			-30 °C ... +100 °C	0,5 m/s	500 bar (7200 psi)		G-ECOPUR	
			-30 °C ... +100 °C	0,5 m/s	250 bar (3600 psi)	ECO-FLON 2	ECORUB. 1	ECO-FLON 2
			-20 °C ... +200 °C	0,5 m/s	250 bar (3600 psi)		ECORUB. 2	
			-50 °C ... +150 °C	0,5 m/s	250 bar (3600 psi)		ECORUB. 3**	
			-25 °C ... +150 °C	0,5 m/s	250 bar (3600 psi)		ECORUB.-H	
	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.				S 13-T	S 14-T	S 15-T
			-30 °C ... +100 °C	0,5 m/s	600 bar (8700 psi)	ECOTAL/ ECOMID*	ECOPUR	ECOTAL/ ECOMID*
			-20 °C ... +100 °C	0,5 m/s	600 bar (8700 psi)		H-ECOPUR	
			-40 °C ... +100 °C	0,5 m/s	600 bar (8700 psi)		T-ECOPUR	
			-20 °C ... +100 °C	0,7 m/s	600 bar (8700 psi)		S-ECOPUR	
			-30 °C ... +100 °C	0,5 m/s	600 bar (8700 psi)		G-ECOPUR	
	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.	-30 °C ... +110 °C	0,5 m/s	160 bar (2300 psi)	ECOPUR		
			-20 °C ... +110 °C	0,5 m/s	160 bar (2300 psi)	H-ECOPUR		
			-50 °C ... +110 °C	0,5 m/s	160 bar (2300 psi)	T-ECOPUR		
			-20 °C ... +110 °C	0,7 m/s	160 bar (2300 psi)	S-ECOPUR		
			-30 °C ... +100 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER 1		
			-25 °C ... +150 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER-H		
			-20 °C ... +200 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER 2		
			-50 °C ... +150 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER 3**		
	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.	-30 °C ... +110 °C	0,5 m/s	160 bar (2300 psi)	ECOPUR		
			-20 °C ... +110 °C	0,5 m/s	160 bar (2300 psi)	H-ECOPUR		
			-50 °C ... +110 °C	0,5 m/s	160 bar (2300 psi)	T-ECOPUR		
			-20 °C ... +110 °C	0,7 m/s	160 bar (2300 psi)	S-ECOPUR		
			-30 °C ... +100 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER 1		
			-25 °C ... +150 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER-H		
			-20 °C ... +200 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER 2		
			-50 °C ... +150 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER 3**		
	S17-P	**hydraulic, single acting** asymmetric rod seal with additional sealing- respectively 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.	-30 °C ... +110 °C	0,5 m/s	400 bar (5800 psi)	ECOPUR		
			-20 °C ... +110 °C	0,5 m/s	400 bar (5800 psi)	H-ECOPUR		
			-20 °C ... +110 °C	0,7 m/s	400 bar (5800 psi)	S-ECOPUR		
			-50 °C ... +110 °C	0,5 m/s	400 bar (5800 psi)	T-ECOPUR		
			-30 °C ... +110 °C	0,5 m/s	400 bar (5800 psi)	G-ECOPUR		
	S17-R	**hydraulic, single acting** as profile S17-P, but more adaptation possibilities for diverse temperatures and media by selection of suitable seal material.	-30 °C ... +110 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER 1		
			-20 °C ... +110 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER 2		
			-50 °C ... +150 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER 3**		
			-25 °C ... +150 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER-H		
	S18-P	**hydraulic, single acting** asymmetric rod seal as S17-P, but due to design with active back-up ring suitable for larger extrusion gaps or higher pressure range.				Seal part	Back-up ring	
			-30 °C ... +100 °C	0,5 m/s	600 bar (8700 psi)	ECOPUR	ECOTAL/ ECOMID*	
			-20 °C ... +100 °C	0,5 m/s	600 bar (8700 psi)	H-ECOPUR		
			-20 °C ... +100 °C	0,7 m/s	600 bar (8700 psi)	S-ECOPUR		
			-40 °C ... +100 °C	0,5 m/s	600 bar (8700 psi)	T-ECOPUR		
			-30 °C ... +100 °C	0,5 m/s	600 bar (8700 psi)	G-ECOPUR		
	S18-R	**hydraulic, single acting** asymmetric rod seal with additional sealing- respectively stabilizing lip and back ring. good adaptation possibilities for diverse temperatures and media by selection of suitable seal material, due to design with active back-up ring suitable for larger extrusion gaps or higher pressure range.				Seal part	Back-up ring	
			-30 °C ... +100 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER 1	ECOTAL	
			-30 °C ... +100 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER 1	ECOMID	
			-20 °C ... +200 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER 2	ECOFLON 2	
			-40 °C ... +100 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER 3	ECOTAL	
			-40 °C ... +100 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER 3	ECOMID	
			-50 °C ... +150 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER 3	ECOFLON 2	
			-20 °C ... +100 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER-H	ECOTAL	
			-20 °C ... +100 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER-H	ECOMID	
			-20 °C ... +150 °C	0,5 m/s	250 bar (3600 psi)	ECORUBBER-H	ECOFLON 2	

linear moving rotating oscillating spiral moving static

* ECOTAL up to ø260 mm, ECOMID above ø260 mm
** attention: not suitable for mineral oils !

Not bolded symbols: please consult our technical dpmt. for application limitations

Application	Profile	Description	Temperature	max.speed	max. Pressure	Material	
						Seal part	Spring
	S19-F	**PTFE-rodseal, 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.	-200 °C ... +260 °C	15 m/s	100 bar (1450 psi)	ECOFLON 1	1.4310
			-200 °C ... +260 °C	15 m/s	160 bar (2300 psi)	ECOFLON 2	1.4310
			-200 °C ... +260 °C	15 m/s	160 bar (2300 psi)	ECOFLON 3	1.4310
			-200 °C ... +80 °C	15 m/s	200 bar (2900 psi)	ECOPE	1.4310
						Seal part	Back-up ring
	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, design with interference fit on outside diameter maintains non-twisting in dynamic applications.	-30 °C ... +100 °C	0,5 m/s	700 bar (10000 psi)	ECORUBBER 1	ECOTAL/ ECOMID*
			-25 °C ... +100 °C	0,5 m/s	700 bar (10000 psi)	ECORUBBER-H	
			-20 °C ... +200 °C	0,5 m/s	700 bar (10000 psi)	ECORUBBER 2	ECOPAEK/ ECOFLON 2
			-25 °C ... +150 °C	0,5 m/s	700 bar (10000 psi)	ECORUBBER-H	
						Seal part	O-ring
	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).	-30 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	ECOPUR	NBR (70 Sh.A)
			-20 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	H-ECOPUR	NBR (70 Sh.A)
			-30 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	T-ECOPUR	NBR (70 Sh.A)
			-20 °C ... +100 °C	0,7 m/s	400 bar (5800 psi)	S-ECOPUR	NBR (70 Sh.A)
			-30 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	G-ECOPUR	NBR (70 Sh.A)
						Seal part	Support ring
	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 in angled design possible.	-30 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	ECOPUR	ECOTAL/ ECOMID*
			-20 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	H-ECOPUR	
			-20 °C ... +100 °C	0,7 m/s	400 bar (5800 psi)	S-ECOPUR	
			-40 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	T-ECOPUR	
			-30 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	G-ECOPUR	
						Seal part	Support ring
	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 in angled design possible.	-30 °C ... +100 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER 1	ECOTAL
			-30 °C ... +100 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER 1	ECOMID
			-20 °C ... +200 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER 2	ECOFLON 2
			-50 °C ... +100 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER 3**	ECOTAL
			-40 °C ... +100 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER 3**	ECOMID
			-50 °C ... +150 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER 3**	ECOFLON 2
			-25 °C ... +100 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER-H	ECOTAL
			-25 °C ... +100 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER-H	ECOMID
			-25 °C ... +150 °C	0,5 m/s	160 bar (2300 psi)	ECORUBBER-H	ECOFLON 2
						Seal	O-ring	Back ring
	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.	-30 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	ECOPUR	NBR (70 Sh.A)	ECOTAL/ ECOMID*
			-20 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	H-ECOPUR	NBR (70 Sh.A)	
			-30 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	T-ECOPUR	NBR (70 Sh.A)	
			-20 °C ... +100 °C	0,7 m/s	400 bar (5800 psi)	S-ECOPUR	NBR (70 Sh.A)	
			-30 °C ... +100 °C	0,5 m/s	400 bar (5800 psi)	G-ECOPUR	NBR (70 Sh.A)	
						S 25-F	S 26-F	S 27-F
	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, pharma and food industry.	-200 °C ... +260 °C	1,5 m/s	100 bar (1450 psi)	ECO-FLON 2	ECOFLON 1	ECO-FLON 2
						S 29-F	S 30-F	S 31-F
	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, pharma and food industry.	-200 °C ... +260 °C	1,5 m/s	315 bar (4500 psi)	ECO-FLON 2	ECOFLON 1	ECO-FLON 2
						Collar	Seal	Back ring
	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).	-30 °C ... +100 °C	0,5 m/s	500 bar (7200 psi)	ECOTAL/ ECOMID*	ECOPUR	ECOTAL/ ECOMID*
			-20 °C ... +100 °C	0,5 m/s	500 bar (7200 psi)		H-ECOPUR	
			-40 °C ... +100 °C	0,5 m/s	500 bar (7200 psi)		T-ECOPUR	
			-20 °C ... +100 °C	0,7 m/s	500 bar (7200 psi)		S-ECOPUR	
			-30 °C ... +100 °C	0,5 m/s	500 bar (7200 psi)		G-ECOPUR	
	S35-P	**hydraulic, double acting** compact rod seal with almost no dead spots as required for applications in food and pharma industry, also commonly used as O-Ring replacement, because design with interference fit on outside diameter maintains non-twisting in dynamic applications.	-30 °C ... +110 °C	0,4 m/s	400 bar (5800 psi)	ECOPUR		
			-20 °C ... +110 °C	0,4 m/s	400 bar (5800 psi)	H-ECOPUR		
			-20 °C ... +110 °C	0,5 m/s	400 bar (5800 psi)	S-ECOPUR		
			-50 °C ... +110 °C	0,4 m/s	400 bar (5800 psi)	T-ECOPUR		
			-30 °C ... +110 °C	0,4 m/s	400 bar (5800 psi)	G-ECOPUR		

linear moving rotating oscillating spiral moving static

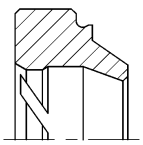
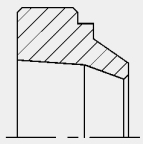
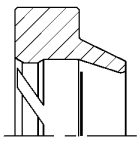
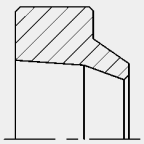
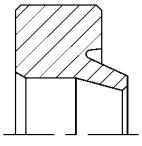
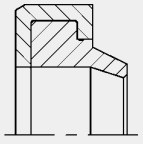
* ECOTAL up to ø260 mm, ECOMID above ø260 mm
** attention: not suitable for mineral oils !

Not bolded symbols: please consult our technical dpmt. for application limitations


ECO R1

Wipers

Wipers new line

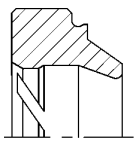
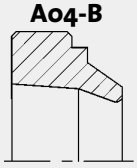
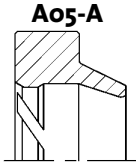
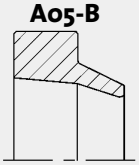
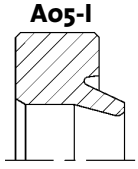
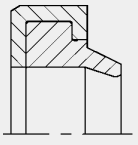
Application	Profile	Description	Temperature	max.speed	Material	
	A01-A 	**hydraulic, single acting** wiper with interference fit on outside diameter, providing a technically accurate closure at the cylinder. wiping edge assures a reliable protection against penetration of dust and dirt whilst allowing backflow of residual oil film. Back support area prevents tilting of wiper. For housings according ISO 6195-TypeA	-30 °C ... +110 °C	4 m/s	ECOPUR	
			-20 °C ... +110 °C	4 m/s	H-ECOPUR	
			-50 °C ... +110 °C	4 m/s	T-ECOPUR	
			-20 °C ... +110 °C	5 m/s	S-ECOPUR	
			-30 °C ... +110 °C	4 m/s	G-ECOPUR	
			-30 °C ... +100 °C	4 m/s	ECORUBBER 1	
			-25 °C ... +150 °C	4 m/s	ECORUBBER-H	
			-20 °C ... +200 °C	4 m/s	ECORUBBER 2	
			-50 °C ... +150 °C	4 m/s	ECORUBBER 3**	
	A01-B 	**hydraulic, single acting** as profile A01-A, but without back support area. for housings according ISO 6195-TypeA	-30 °C ... +110 °C	4 m/s	ECOPUR	
			-20 °C ... +110 °C	4 m/s	H-ECOPUR	
			-50 °C ... +110 °C	4 m/s	T-ECOPUR	
			-20 °C ... +110 °C	5 m/s	S-ECOPUR	
			-30 °C ... +110 °C	4 m/s	G-ECOPUR	
			-30 °C ... +100 °C	4 m/s	ECORUBBER 1	
			-25 °C ... +150 °C	4 m/s	ECORUBBER-H	
			-20 °C ... +200 °C	4 m/s	ECORUBBER 2	
			-50 °C ... +150 °C	4 m/s	ECORUBBER 3**	
	A02-A 	**hydraulic, single acting** wiper with interference fit on outside diameter. wiping edge assures a reliable protection against penetration of dust and dirt whilst allowing backflow of residual oil film. back support area prevents tilting of wiper.	-30 °C ... +110 °C	4 m/s	ECOPUR	
			-20 °C ... +110 °C	4 m/s	H-ECOPUR	
			-50 °C ... +110 °C	4 m/s	T-ECOPUR	
			-20 °C ... +110 °C	5 m/s	S-ECOPUR	
			-30 °C ... +110 °C	4 m/s	G-ECOPUR	
			-30 °C ... +100 °C	4 m/s	ECORUBBER 1	
			-25 °C ... +150 °C	4 m/s	ECORUBBER-H	
			-20 °C ... +200 °C	4 m/s	ECORUBBER 2	
			-50 °C ... +150 °C	4 m/s	ECORUBBER 3**	
	A02- B 	**hydraulic, single acting** wiper with interference fit on outside diameter. wiping edge assures a reliable protection against penetration of dust and dirt whilst allowing backflow of residual oil film.	-30 °C ... +110 °C	4 m/s	ECOPUR	
			-20 °C ... +110 °C	4 m/s	H-ECOPUR	
			-50 °C ... +110 °C	4 m/s	T-ECOPUR	
			-20 °C ... +110 °C	5 m/s	S-ECOPUR	
			-30 °C ... +110 °C	4 m/s	G-ECOPUR	
			-30 °C ... +100 °C	4 m/s	ECORUBBER 1	
			-25 °C ... +150 °C	4 m/s	ECORUBBER-H	
			-20 °C ... +200 °C	4 m/s	ECORUBBER 2	
			-50 °C ... +150 °C	4 m/s	ECORUBBER 3**	
	A02-I 	**hydraulic, single acting** as profile A02-A, but without back support area. special housing design according ISO 6195-TypeC	-30 °C ... +110 °C	4 m/s	ECOPUR	
			-20 °C ... +110 °C	4 m/s	H-ECOPUR	
			-50 °C ... +110 °C	4 m/s	T-ECOPUR	
			-20 °C ... +110 °C	5 m/s	S-ECOPUR	
			-30 °C ... +110 °C	4 m/s	G-ECOPUR	
			-30 °C ... +100 °C	4 m/s	ECORUBBER 1	
			-25 °C ... +150 °C	4 m/s	ECORUBBER-H	
			-20 °C ... +200 °C	4 m/s	ECORUBBER 2	
			-50 °C ... +150 °C	4 m/s	ECORUBBER 3**	
	A03-A 	**hydraulic, single acting** wiper with mounting cage for press-fit installation into axially open housings. wiping edge assures 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-TypeB			Wiping part	Housing
			-30 °C ... +80 °C	4 m/s	ECOPUR	ECOTAL/ ECOMID*
			-20 °C ... +80 °C	4 m/s	H-ECOPUR	
			-40 °C ... +80 °C	4 m/s	T-ECOPUR	
			-20 °C ... +80 °C	5 m/s	S-ECOPUR	
			-30 °C ... +80 °C	4 m/s	G-ECOPUR	
			-30 °C ... +80 °C	4 m/s	ECORUBBER 1	
			-25 °C ... +80 °C	4 m/s	ECORUBBER-H	
			-20 °C ... +200 °C	4 m/s	ECORUBBER 2	ECOPAEK
			-50 °C ... +150 °C	4 m/s	ECORUBBER 3**	

linear moving rotating oscillating spiral moving static

* ECOTAL up to ø260 mm, ECOMID above ø260 mm
** attention: not suitable for mineral oils !

Not bolded symbols: please consult our technical dpmt. for application limitations

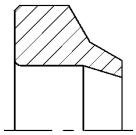
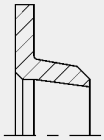
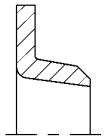
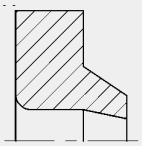
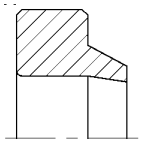
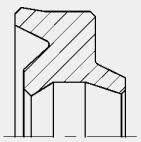
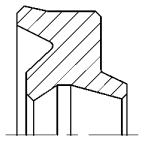
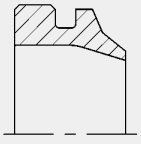
Wipe of profiles

Application	Profile	Description	Temperature	max.speed	Material	
	A04-A 	**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-TypeA	-30 °C ... +110 °C	4 m/s	ECOPUR	
			-20 °C ... +110 °C	4 m/s	H-ECOPUR	
			-50 °C ... +110 °C	4 m/s	T-ECOPUR	
			-20 °C ... +110 °C	5 m/s	S-ECOPUR	
			-30 °C ... +110 °C	4 m/s	G-ECOPUR	
			-30 °C ... +100 °C	4 m/s	ECORUBBER 1	
			-25 °C ... +150 °C	4 m/s	ECORUBBER-H	
			-20 °C ... +200 °C	4 m/s	ECORUBBER 2	
			-50 °C ... +150 °C	4 m/s	ECORUBBER 3**	
	A04-B 	**pneumatic, single acting** as profile A04-A, but without back support area. for housings according ISO 6195-TypeA	-30 °C ... +110 °C	4 m/s	ECOPUR	
			-20 °C ... +110 °C	4 m/s	H-ECOPUR	
			-50 °C ... +110 °C	4 m/s	T-ECOPUR	
			-20 °C ... +110 °C	5 m/s	S-ECOPUR	
			-30 °C ... +110 °C	4 m/s	G-ECOPUR	
			-30 °C ... +100 °C	4 m/s	ECORUBBER I	
			-25 °C ... +150 °C	4 m/s	ECORUBBER-H	
			-20 °C ... +200 °C	4 m/s	ECORUBBER 2	
			-50 °C ... +150 °C	4 m/s	ECORUBBER 3**	
	A05-A 	**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.	-30 °C ... +110 °C	4 m/s	ECOPUR	
			-20 °C ... +110 °C	4 m/s	H-ECOPUR	
			-50 °C ... +110 °C	4 m/s	T-ECOPUR	
			-20 °C ... +110 °C	5 m/s	S-ECOPUR	
			-30 °C ... +110 °C	4 m/s	G-ECOPUR	
			-30 °C ... +100 °C	4 m/s	ECORUBBER I	
			-25 °C ... +150 °C	4 m/s	ECORUBBER-H	
			-20 °C ... +200 °C	4 m/s	ECORUBBER 2	
			-50 °C ... +150 °C	4 m/s	ECORUBBER 3**	
	A05-B 	**pneumatic, single acting** wiper with interference fit on outside diameter. special design of wiping lip allows retention of initial lubricating film.	-30 °C ... +110 °C	4 m/s	ECOPUR	
			-20 °C ... +110 °C	4 m/s	H-ECOPUR	
			-50 °C ... +110 °C	4 m/s	T-ECOPUR	
			-20 °C ... +110 °C	5 m/s	S-ECOPUR	
			-30 °C ... +110 °C	4 m/s	G-ECOPUR	
			-30 °C ... +100 °C	4 m/s	ECORUBBER I	
			-25 °C ... +150 °C	4 m/s	ECORUBBER-H	
			-20 °C ... +200 °C	4 m/s	ECORUBBER 2	
			-50 °C ... +150 °C	4 m/s	ECORUBBER 3**	
	A05-I 	**pneumatic, single acting** as profile A05-A, but without back support area. special housing design according ISO 6195-TypeC	-30 °C ... +110 °C	4 m/s	ECOPUR	
			-20 °C ... +110 °C	4 m/s	H-ECOPUR	
			-50 °C ... +110 °C	4 m/s	T-ECOPUR	
			-20 °C ... +110 °C	5 m/s	S-ECOPUR	
			-30 °C ... +110 °C	4 m/s	G-ECOPUR	
			-30 °C ... +100 °C	4 m/s	ECORUBBER I	
			-25 °C ... +150 °C	4 m/s	ECORUBBER-H	
			-20 °C ... +200 °C	4 m/s	ECORUBBER 2	
			-50 °C ... +150 °C	4 m/s	ECORUBBER 3**	
	A06-A 	**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-TypeB			Wiping part	Housing
			-30 °C ... +80 °C	4 m/s	ECOPUR	ECOTAL/ ECOMID*
			-20 °C ... +80 °C	4 m/s	H-ECOPUR	
			-40 °C ... +80 °C	4 m/s	T-ECOPUR	
			-20 °C ... +80 °C	5 m/s	S-ECOPUR	
			-30 °C ... +80 °C	4 m/s	G-ECOPUR	
			-30 °C ... +80 °C	4 m/s	ECORUBBER 1	
			-25 °C ... +80 °C	4 m/s	ECORUBBER-H	
			-20 °C ... +200 °C	4 m/s	ECORUBBER 2	ECOPAEK
			-50 °C ... +150 °C	4 m/s	ECORUBBER 3**	

linear moving · rotating · oscillating · spiral moving · static

Not bolded symbols: please consult our technical dpmt. for application limitations

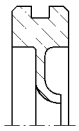
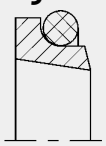
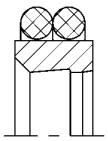
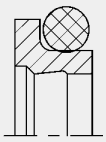
* ECOTAL up to ø260 mm, ECOMID above ø260 mm
** attention: not suitable for mineral oils !

Application	Profile	Description	Temperature	max.speed	Material
	A07-A 	**hydraulic, single acting** wiper to fit in angled housings (30°angle). design mainly used in british equipment, in inch as well as metric dimensions.	-30 °C ... +110 °C -20 °C ... +110 °C -50 °C ... +110 °C -20 °C ... +110 °C -30 °C ... +110 °C -30 °C ... +100 °C -25 °C ... +150 °C -20 °C ... +200 °C -50 °C ... +150 °C	4 m/s 4 m/s 4 m/s 5 m/s 4 m/s 4 m/s 4 m/s 4 m/s 4 m/s	ECOPUR H-ECOPUR T-ECOPUR S-ECOPUR G-ECOPUR ECORUBBER 1 ECORUBBER-H ECORUBBER 2 ECORUBBER 3**
	A08-A 	**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.	-30 °C ... +110 °C -20 °C ... +110 °C -50 °C ... +110 °C -20 °C ... +110 °C -30 °C ... +110 °C -30 °C ... +100 °C -25 °C ... +150 °C -20 °C ... +200 °C -50 °C ... +150 °C	4 m/s 4 m/s 4 m/s 5 m/s 4 m/s 4 m/s 4 m/s 4 m/s 4 m/s	ECOPUR H-ECOPUR T-ECOPUR S-ECOPUR G-ECOPUR ECORUBBER 1 ECORUBBER-H ECORUBBER 2 ECORUBBER 3**
	A08-B 	**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.	-30 °C ... +110 °C -20 °C ... +110 °C -50 °C ... +110 °C -20 °C ... +110 °C -30 °C ... +110 °C -30 °C ... +100 °C -25 °C ... +150 °C -20 °C ... +200 °C -50 °C ... +150 °C	4 m/s 4 m/s 4 m/s 5 m/s 4 m/s 4 m/s 4 m/s 4 m/s 4 m/s	ECOPUR H-ECOPUR T-ECOPUR S-ECOPUR G-ECOPUR ECORUBBER 1 ECORUBBER-H ECORUBBER 2 ECORUBBER 3**
	A09-A 	**hydraulic, single acting** wiper with dimensioning according to common types used in USA. for housings according AN 6231, ANSI/B93.35	-30 °C ... +110 °C -20 °C ... +110 °C -50 °C ... +110 °C -20 °C ... +110 °C -30 °C ... +110 °C -30 °C ... +100 °C -25 °C ... +150 °C -20 °C ... +200 °C -50 °C ... +150 °C	4 m/s 4 m/s 4 m/s 5 m/s 4 m/s 4 m/s 4 m/s 4 m/s 4 m/s	ECOPUR H-ECOPUR T-ECOPUR S-ECOPUR G-ECOPUR ECORUBBER 1 ECORUBBER-H ECORUBBER 2 ECORUBBER 3**
	A10-A 	**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	-30 °C ... +110 °C -20 °C ... +110 °C -50 °C ... +110 °C -20 °C ... +110 °C -30 °C ... +110 °C -30 °C ... +100 °C -25 °C ... +150 °C -20 °C ... +200 °C -50 °C ... +150 °C	4 m/s 4 m/s 4 m/s 5 m/s 4 m/s 4 m/s 4 m/s 4 m/s 4 m/s	ECOPUR H-ECOPUR T-ECOPUR S-ECOPUR G-ECOPUR ECORUBBER 1 ECORUBBER-H ECORUBBER 2 ECORUBBER 3**
	A11-A 	**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: 16 bar (230 psi)	-30 °C ... +110 °C -20 °C ... +110 °C -50 °C ... +110 °C -20 °C ... +110 °C -30 °C ... +110 °C -30 °C ... +100 °C -25 °C ... +150 °C -20 °C ... +200 °C -50 °C ... +150 °C	4 m/s 4 m/s 4 m/s 5 m/s 4 m/s 4 m/s 4 m/s 4 m/s 4 m/s	ECOPUR H-ECOPUR T-ECOPUR S-ECOPUR G-ECOPUR ECORUBBER 1 ECORUBBER-H ECORUBBER 2 ECORUBBER 3**
	A11-I 	**hydraulic/pneumatic, double acting** as profile A11-A, special housing design according ISO 6195-TypeC	-30 °C ... +110 °C -20 °C ... +110 °C -50 °C ... +110 °C -20 °C ... +110 °C -30 °C ... +110 °C -30 °C ... +100 °C -25 °C ... +150 °C -20 °C ... +200 °C -50 °C ... +150 °C	4 m/s 4 m/s 4 m/s 5 m/s 4 m/s 4 m/s 4 m/s 4 m/s 4 m/s	ECOPUR H-ECOPUR T-ECOPUR S-ECOPUR G-ECOPUR ECORUBBER 1 ECORUBBER-H ECORUBBER 2 ECORUBBER 3**
	A12-A 	**hydraulic, single acting** wiper with secondary lip, the technically accurate closure at the cylinder is providing reliable protection, even for heavy contamination.	-30 °C ... +110 °C -20 °C ... +110 °C -50 °C ... +110 °C -20 °C ... +110 °C -30 °C ... +110 °C	4 m/s 4 m/s 4 m/s 5 m/s 4 m/s	ECOPUR H-ECOPUR T-ECOPUR S-ECOPUR G-ECOPUR

linear moving rotating oscillating spiral moving static

* ECOTAL up to ø260 mm, ECOMID above ø260 mm
** attention: not suitable for mineral oils !

Not bolded symbols: please consult our technical dpmt. for application limitations

Application	Profile	Description	Temperature	max.speed	max.Pressure	Material	
	A13-A 	**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 strenght.	-50 °C ... +80 °C	1 m/s	-	ECOTAL	
			-40 °C ... +80 °C	1 m/s	-	ECOMID*	
			-50 °C ... +260 °C	1 m/s	-	ECOPAEK	
	A25-F 	**hydraulic/pneumatic, single acting** PTFE-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).				Glide ring	Energizer
			-30 °C ... +100 °C	10 m/s	-	ECOFLON 2	NBR (70Sh.A)
			-20 °C ... +200 °C	10 m/s	-	ECOFLON 2	FPM (75Sh.A)
			-30 °C ... +100 °C	10 m/s	-	ECOFLON 3	NBR (70Sh.A)
			-20 °C ... +200 °C	10 m/s	-	ECOFLON 3	FPM (75Sh.A)
			-30 °C ... +100 °C	10 m/s	-	ECOFLON 4	NBR (70Sh.A)
			-20 °C ... +200 °C	10 m/s	-	ECOFLON 4	FPM (75Sh.A)
	A26-F 	**hydraulic/pneumatic, double acting** PTFE-double wiper with two O-rings as preloading elements. wiping edge assures 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).				Glide ring	Energizer
			-30 °C ... +100 °C	10 m/s	16 bar (230 psi)	ECOFLON 2	NBR (70Sh.A)
			-20 °C ... +200 °C	10 m/s	16 bar (230 psi)	ECOFLON 2	FPM (75Sh.A)
			-30 °C ... +100 °C	10 m/s	16 bar (230 psi)	ECOFLON 3	NBR (70Sh.A)
			-20 °C ... +200 °C	10 m/s	16 bar (230 psi)	ECOFLON 3	FPM (75Sh.A)
			-30 °C ... +100 °C	10 m/s	16 bar (230 psi)	ECOFLON 4	NBR (70Sh.A)
			-20 °C ... +200 °C	10 m/s	16 bar (230 psi)	ECOFLON 4	FPM (75Sh.A)
	A27-F 	**hydraulic/pneumatic, double acting** PTFE-double wiper with O-ring as preloading element. wiping edge assures 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).				Glide ring	Energizer
			-30 °C ... +100 °C	10 m/s	16 bar (230 psi)	ECOFLON 2	NBR (70Sh.A)
			-20 °C ... +200 °C	10 m/s	16 bar (230 psi)	ECOFLON 2	FPM (75Sh.A)
			-30 °C ... +100 °C	10 m/s	16 bar (230 psi)	ECOFLON 3	NBR (70Sh.A)
			-20 °C ... +200 °C	10 m/s	16 bar (230 psi)	ECOFLON 3	FPM (75Sh.A)
			-30 °C ... +100 °C	10 m/s	16 bar (230 psi)	ECOFLON 4	NBR (70Sh.A)
			-20 °C ... +200 °C	10 m/s	16 bar (230 psi)	ECOFLON 4	FPM (75Sh.A)

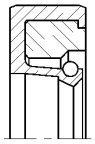
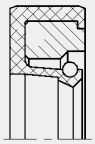
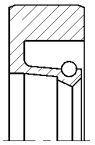
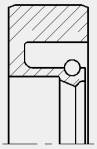
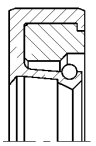
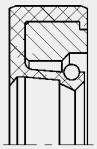
linear moving rotating oscillating spiral moving static

Not bolded symbols: please consult our technical dpmt. for application limitations

* ECOTAL up to ø260 mm, ECOMID above ø260 mm
** attention: not suitable for mineral oils !

Rotary seals

Rotary seals

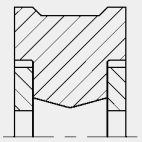
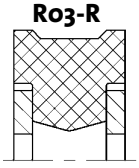
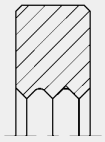
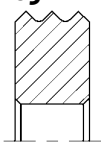
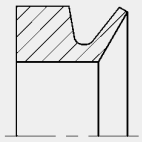
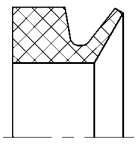
Application	Profile	Description	Temperature	max.speed	max. Pressure	Material	
						Seal part	Energizer
	R01-P 	**single acting rotary shaft seal** spring loaded lip seal with retainer ring for press-fit installation into axially open housings. wide range of applications in every sector of industry, mainly as protecting element for bearings.	-30 °C ... +80 °C	5 m/s	0,5 bar (7 psi)	ECOPUR	ECOTAL/ ECOMID*
			-20 °C ... +80 °C	5 m/s	0,5 bar (7 psi)	H-ECOPUR	
			-40 °C ... +80 °C	5 m/s	0,5 bar (7 psi)	T-ECOPUR	
			-20 °C ... +80 °C	6 m/s	0,5 bar (7 psi)	S-ECOPUR	
			-30 °C ... +80 °C	5 m/s	0,5 bar (7 psi)	G-ECOPUR	
	R01-R 	**single acting rotary shaft seal** spring loaded lip seal with retainer ring for press-fit installation into axially open housings. good adaptation possibilities 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.				Seal part	Energizer
			-30 °C ... +80 °C	10 m/s	0,5 bar (7 psi)	ECORUBBER 1	ECOTAL/ ECOMID*
			-25 °C ... +80 °C	10 m/s	0,5 bar (7 psi)	ECORUBBER-H	
			-20 °C ... +200 °C	15 m/s	0,5 bar (7 psi)	ECORUBBER 2	METAL
			-50 °C ... +80 °C	10 m/s	0,5 bar (7 psi)	ECORUBBER 3**	ECOTAL
			-50 °C ... +150 °C	10 m/s	0,5 bar (7 psi)	ECORUBBER 3**	METAL
			-50 °C ... +80 °C	5 m/s	0,2 bar (3 psi)	ECOSIL	ECOTAL
			-60 °C ... +200 °C	5 m/s	0,2 bar (3 psi)	ECOSIL	METAL
	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.	-30 °C ... +110 °C	5 m/s	0,5 bar (7 psi)	ECOPUR	
			-20 °C ... +110 °C	5 m/s	0,5 bar (7 psi)	H-ECOPUR	
			-50 °C ... +110 °C	5 m/s	0,5 bar (7 psi)	T-ECOPUR	
			-20 °C ... +110 °C	6 m/s	0,5 bar (7 psi)	S-ECOPUR	
			-30 °C ... +100 °C	5 m/s	0,5 bar (7 psi)	G-ECOPUR	
			-30 °C ... +100 °C	10 m/s	0,5 bar (7 psi)	ECORUBBER 1	
			-25 °C ... +150 °C	10 m/s	0,5 bar (7 psi)	ECORUBBER-H	
			-20 °C ... +200 °C	15 m/s	0,5 bar (7 psi)	ECORUBBER 2	
			-50 °C ... +150 °C	10 m/s	0,2 bar (3 psi)	ECORUBBER 3**	
			-60 °C ... +200 °C	5 m/s	0,2 bar (3 psi)	ECOSIL	
	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 machanisms in heavy duty machinery, for shipbuilding industry and civil engineering.	-30 °C ... +110 °C	5 m/s	0,5 bar (7 psi)	ECOPUR	
			-20 °C ... +110 °C	5 m/s	0,5 bar (7 psi)	H-ECOPUR	
			-50 °C ... +110 °C	5 m/s	0,5 bar (7 psi)	T-ECOPUR	
			-20 °C ... +110 °C	6 m/s	0,5 bar (7 psi)	S-ECOPUR	
			-30 °C ... +100 °C	5 m/s	0,5 bar (7 psi)	G-ECOPUR	
			-30 °C ... +100 °C	10 m/s	0,5 bar (7 psi)	ECORUBBER 1	
			-25 °C ... +150 °C	10 m/s	0,5 bar (7 psi)	ECORUBBER-H	
			-20 °C ... +200 °C	15 m/s	0,5 bar (7 psi)	ECORUBBER 2	
			-50 °C ... +150 °C	10 m/s	0,2 bar (3 psi)	ECORUBBER 3**	
			-60 °C ... +200 °C	5 m/s	0,2 bar (3 psi)	ECOSIL	
	R02-P 	**single acting rotary shaft seal** as profile R01-P, but with additional dust lip to avoid ingress of dust and dirt.				Seal part	Energizer
			-30 °C ... +80 °C	5 m/s	0,5 bar (7 psi)	ECOPUR	ECOTAL/ ECOMID*
			-20 °C ... +80 °C	5 m/s	0,5 bar (7 psi)	H-ECOPUR	
			-40 °C ... +80 °C	5 m/s	0,5 bar (7 psi)	T-ECOPUR	
			-20 °C ... +80 °C	6 m/s	0,5 bar (7 psi)	S-ECOPUR	
			-30 °C ... +80 °C	5 m/s	0,5 bar (7 psi)	G-ECOPUR	
	R02-R 	**single acting rotary shaft seal** as profile R01-R, but with additional dust lip to avoid ingress of dust and dirt.				Seal part	Energizer
			-30 °C ... +80 °C	10 m/s	0,5 bar (7 psi)	ECORUBBER 1	ECOTAL/ ECOMID*
			-25 °C ... +80 °C	10 m/s	0,5 bar (7 psi)	ECORUBBER-H	
			-20 °C ... +200 °C	15 m/s	0,5 bar (7 psi)	ECORUBBER 2	METAL
			-50 °C ... +80 °C	10 m/s	0,5 bar (7 psi)	ECORUBBER 3**	ECOTAL
			-50 °C ... +150 °C	10 m/s	0,5 bar (7 psi)	ECORUBBER 3**	METAL
			-50 °C ... +80 °C	5 m/s	0,2 bar (3 psi)	ECOSIL	ECOTAL
			-60 °C ... +200 °C	5 m/s	0,2 bar (3 psi)	ECOSIL	METAL

linear moving rotating oscillating spiral moving static

* ECOTAL up to ø260 mm, ECOMID above ø260 mm
** attention: not suitable for mineral oils !

Not bolded symbols: please consult our technical dpmt. for application limitations

# of profiles

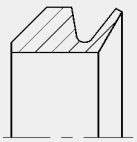
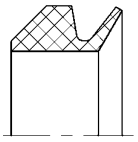
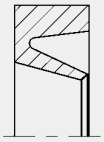
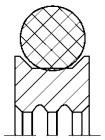
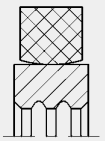
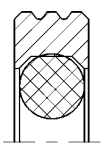
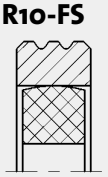
Application	Profile	Description	Temperature	max.speed	max. Pressure	Material	
	R03-P	**double acting rotary seal** rotary seal with integrated backup rings for pivoting motion in hydraulic systems. interference fit on outside diameter maintains stable fit in the housing, back-up rings permit larger extrusion gap / higher pressure. mainly used for rotary pivots on excavators, grabs				Seal part	Back ring
			-30 °C ... +100 °C	0,2 m/s	400 bar (5800 psi)	ECOPUR	ECOTAL/ ECOMID*
			-20 °C ... +100 °C	0,2 m/s	400 bar (5800 psi)	H-ECOPUR	
			-40 °C ... +100 °C	0,2 m/s	400 bar (5800 psi)	T-ECOPUR	
			-20 °C ... +100 °C	0,3 m/s	400 bar (5800 psi)	S-ECOPUR	
			-30 °C ... +100 °C	0,2 m/s	400 bar (5800 psi)	G-ECOPUR	
	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.				Seal part	Back rings
			-30 °C ... +100 °C	0,2 m/s	250 bar (3600 psi)	ECORUBBER 1	ECOTAL
			-30 °C ... +100 °C	0,2 m/s	250 bar (3600 psi)	ECORUBBER 1	ECOMID
			-25 °C ... +100 °C	0,2 m/s	250 bar (3600 psi)	ECORUBBER-H	ECOTAL
			-25 °C ... +100 °C	0,2 m/s	250 bar (3600 psi)	ECORUBBER-H	ECOMID*
			-20 °C ... +200 °C	0,2 m/s	250 bar (3600 psi)	ECORUBBER 2	ECOFLON
	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.	-30 °C ... +110 °C	0,2 m/s	160 bar (2300 psi)	ECOPUR	
			-20 °C ... +110 °C	0,2 m/s	160 bar (2300 psi)	H-ECOPUR	
			-50 °C ... +110 °C	0,2 m/s	160 bar (2300 psi)	T-ECOPUR	
			-20 °C ... +110 °C	0,3 m/s	160 bar (2300 psi)	S-ECOPUR	
			-30 °C ... +110 °C	0,2 m/s	160 bar (2300 psi)	G-ECOPUR	
			-30 °C ... +100 °C	0,2 m/s	100 bar (1450 psi)	ECORUBBER 1	
			-25 °C ... +150 °C	0,2 m/s	100 bar (1450 psi)	ECORUBBER-H	
			-20 °C ... +200 °C	0,2 m/s	100 bar (1450 psi)	ECORUBBER 2	
			-50 °C ... +150 °C	0,2 m/s	100 bar (1450 psi)	ECORUBBER 3**	
	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.	-30 °C ... +110 °C	0,2 m/s	160 bar (2300 psi)	ECOPUR	
			-20 °C ... +110 °C	0,2 m/s	160 bar (2300 psi)	H-ECOPUR	
			-50 °C ... +110 °C	0,2 m/s	160 bar (2300 psi)	T-ECOPUR	
			-20 °C ... +110 °C	0,3 m/s	160 bar (2300 psi)	S-ECOPUR	
			-30 °C ... +110 °C	0,2 m/s	160 bar (2300 psi)	G-ECOPUR	
			-30 °C ... +100 °C	0,2 m/s	100 bar (1450 psi)	ECORUBBER 1	
			-25 °C ... +150 °C	0,2 m/s	100 bar (1450 psi)	ECORUBBER-H	
			-20 °C ... +200 °C	0,2 m/s	100 bar (1450 psi)	ECORUBBER 2	
			-50 °C ... +150 °C	0,2 m/s	100 bar (1450 psi)	ECORUBBER 3**	
	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, oilsplash, watersplash and similar media. acting as a seal- and slingerring.	-30 °C ... +110 °C	25 m/s	-	ECOPUR	
			-20 °C ... +110 °C	25 m/s	-	H-ECOPUR	
			-50 °C ... +110 °C	25 m/s	-	T-ECOPUR	
			-20 °C ... +110 °C	25 m/s	-	S-ECOPUR	
			-30 °C ... +110 °C	25 m/s	-	G-ECOPUR	
	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.	-30 °C ... +100 °C	25 m/s	-	ECORUBBER 1	
			-20 °C ... +200 °C	25 m/s	-	ECORUBBER 2	
			-50 °C ... +150 °C	25 m/s	-	ECORUBBER 3**	
			-25 °C ... +150 °C	25 m/s	-	ECORUBBER-H	

linear moving rotating oscillating spiral moving static

Not bolded symbols: please consult our technical dpmt. for application limitations

* ECOTAL up to ø260 mm, ECOMID above ø260 mm

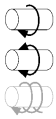
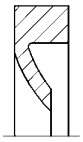
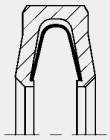
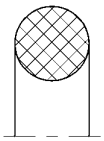
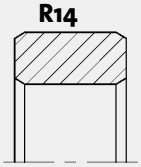
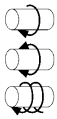
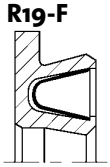
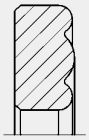
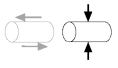
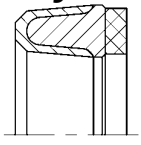
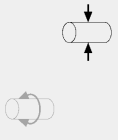
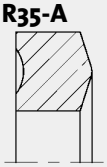
** attention: not suitable for mineral oils !

Application	Profile	Description	Temperature	max.speed	max. Pressure	Material	
	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, oilsplash, watersplash and similar media. acting as a seal- and slingerring.	-30 °C ... +110 °C -20 °C ... +110 °C -50 °C ... +110 °C -20 °C ... +110 °C -30 °C ... +110 °C	25 m/s 25 m/s 25 m/s 25 m/s 25 m/s	- - - - -	ECOPUR H-ECOPUR T-ECOPUR S-ECOPUR G-ECOPUR	
	R07-R 	**axially acting rotary seal** elastic, good wear resistant V-Ring as profile R07-P, but more adaptation possibilities for diverse temperatures and media by selection of suitable seal material.	-30 °C ... +100 °C -20 °C ... +200 °C -50 °C ... +150 °C -25 °C ... +150 °C	25 m/s 25 m/s 25 m/s 25 m/s	- - - -	ECORUBBER 1 ECORUBBER 2 ECORUBBER 3** ECORUBBER-H	
	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.	upon application	upon application	upon application	all materials possible	
	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.	-30 °C ... +100 °C -30 °C ... +100 °C -30 °C ... +80 °C	0,4 m/s 0,4 m/s 0,4 m/s	350 bar (5000 psi) 350 bar (5000 psi) 350 bar (5000 psi)	**Glide ring** ECOFLON 2,3,4 ECOFLON 2,3,4 ECOPE	**Energizer** NBR (70Sh.A) ECORUBBER 1
	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.	-30 °C ... +100 °C -30 °C ... +100 °C -30 °C ... +80 °C	0,4 m/s 0,4 m/s 0,4 m/s	350 bar (5000 psi) 350 bar (5000 psi) 350 bar (5000 psi)	**Glide ring** ECOFLON 2,3,4 ECOFLON 2,3,4 ECOPE	**Energizer** NBR (70Sh.A) ECORUBBER 1
	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.	-30 °C ... +100 °C -30 °C ... +100 °C -30 °C ... +80 °C	0,4 m/s 0,4 m/s 0,4 m/s	350 bar (5000 psi) 350 bar (5000 psi) 350 bar (5000 psi)	**Glide ring** ECOFLON 2,3,4 ECOFLON 2,3,4 ECOPE	**Energizer** NBR (70Sh.A) ECORUBBER 1
	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.	-30 °C ... +100 °C -30 °C ... +100 °C -30 °C ... +80 °C	0,4 m/s 0,4 m/s 0,4 m/s	350 bar (5000 psi) 350 bar (5000 psi) 350 bar (5000 psi)	**Glide ring** ECOFLON 2,3,4 ECOFLON 2,3,4 ECOPE	**Energizer** NBR (70Sh.A) ECORUBBER 1

linear moving rotating oscillating spiral moving static

* ECOTAL up to ø260 mm, ECOMID above ø260 mm
** attention: not suitable for mineral oils !

Not bolded symbols: please consult our technical dpmt. for application limitations

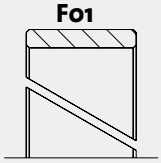
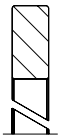
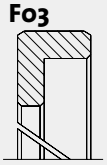
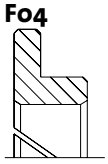
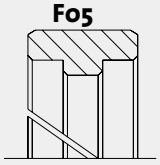
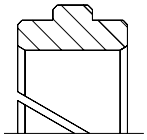
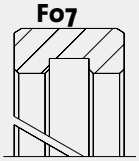
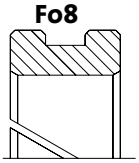
Application	Profile	Description	Temperature	max.speed	max. Pressure	Material	
	**R11-F** 	**single acting PTFE rotary seal** space saving rotary seal, deformed sealing lip acts selfadjusting on increasing temperature. for axially open housings with clamping plate fixation, elastic secondary seal or integrated O-ring necessary for static sealing in the housing. excellent chemical and thermal resistance, suitable for high speed applications.	-200°C ... +260°C	20 m/s	5 bar (70 psi)	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.				Seal	Spring
			-200°C ... +260°C	15 m/s	300 bar (4300 psi)	ECOFLON 2,3,4	1.4310
	**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 prefer profiles like S20/K20 or S35/K35.	-30 °C ... +110 °C	-	600 bar (8700 psi)	ECOPUR	
			-20 °C ... +110 °C	-	600 bar (8700 psi)	H-ECOPUR	
			-50 °C ... +110 °C	-	600 bar (8700 psi)	T-ECOPUR	
			-20 °C ... +110 °C	-	600 bar (8700 psi)	S-ECOPUR	
			-30 °C ... +110 °C	-	600 bar (8700 psi)	G-ECOPUR	
			-30 °C ... +100 °C	-	160 bar (2300 psi)	ECORUBBER 1	
			-20 °C ... +200°C	-	160 bar (2300 psi)	ECORUBBER 2	
			-50 °C ... +50 °C	-	160 bar (2300 psi)	ECORUBBER 3**	
			-25 °C ... +150 °C	-	160 bar (2300 psi)	ECORUBBER-H	
			-200°C .. +260°C	-	160 bar (2300 psi)	ECOFLON 1	
	**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.	upon application	upon application	upon application	all materials possible	
	**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.				Seal	Spring
			-200 °C ... +260 °C	2 m/s	150 bar (2100 psi)	ECOFLON 2,3,4	1.4310
			upon application	upon application	upon application	all other materials possible	1.4310
	**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.	-30 °C ... +110 °C	-	800 bar (11600 psi)	ECOPUR	
			-20 °C ... +110 °C	-	800 bar (11600 psi)	H-ECOPUR	
			-50 °C ... +110 °C	-	800 bar (11600 psi)	T-ECOPUR	
			-20 °C ... +110 °C	-	800 bar (11600 psi)	S-ECOPUR	
			-30 °C ... +110 °C	-	800 bar (11600 psi)	G-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.				Seal	Cover	Backup
			-20 °C ... +100 °C	0,5 m/s	500 bar (7200 psi)	ECORUBBER 2	ECOFLON	ECOTAL
			-25 °C ... +100 °C	0,5 m/s	500 bar (7200 psi)	ECORUBBER-H	ECOFLON	ECOTAL
			-20 °C ... +200 °C	0,5 m/s	1000 bar (14500 psi)	ECORUBBER 2	ECOFLON	ECOPAEK
			-25 °C ... +200 °C	0,5 m/s	1000 bar (14500 psi)	ECORUBBER-H	ECOFLON	ECOPAEK
	**R35-A** 	**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.	-30 °C ... +110 °C	-	800 bar (11600 psi)	ECOPUR	
			-20 °C ... +110 °C	-	800 bar (11600 psi)	H-ECOPUR	
			-50 °C ... +110 °C	-	800 bar (11600 psi)	T-ECOPUR	
			-20 °C ... +110 °C	-	800 bar (11600 psi)	S-ECOPUR	
			-30 °C ... +110 °C	-	800 bar (11600 psi)	G-ECOPUR	
			-30 °C ... +100 °C	-	250 bar (3600 psi)	ECORUBBER 1	
			-20 °C ... +200 °C	-	250 bar (3600 psi)	ECORUBBER 2	
			-50 °C ... +150 °C	-	250 bar (3600 psi)	ECORUBBER 3**	
			-25 °C ... +150 °C	-	250 bar (3600 psi)	ECORUBBER H	
			-60 °C ... +200 °C	-	250 bar (3600 psi)	ECOSIL	

 linear moving  rotating  oscillating  spiral moving  static

* ECOTAL up to ø260 mm, ECOMID above ø260 mm
** attention: not suitable for mineral oils !

Not bolded symbols: please consult our technical dpmt. for application limitations

Guide rings

Application	Profile	Description	Temperature	max.speed	max. specific load	Material
	Fo1 	**guide ring** 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)	-50 °C ... +100 °C -40 °C ... +100 °C -200 °C ... +200 °C -200 °C ... +200 °C -200 °C ... +200 °C -40 °C ... +130 °C	4 m/s 4 m/s 4 m/s 5 m/s 5 m/s 1 m/s	25 N/mm² 25 N/mm² 3 N/mm² 4,5 N/mm² 7,5 N/mm² 90 N/mm²	ECOTAL ECOMID* ECOFLON 2 ECOFLON 40% Bz. ECOFLON 60% Bz. ECOTEX ***
	Fo2 	**guide ring** for rod or piston application, split and non split design available. not only used as guidering, also as plain washer or spacer.	-50 °C ... +100 °C -40 °C ... +100 °C -200 °C ... +200 °C -200 °C ... +200 °C -200 °C ... +200 °C -40 °C ... +130 °C	4 m/s 4 m/s 4 m/s 5 m/s 5 m/s 1 m/s	25 N/mm² 25 N/mm² 3 N/mm² 4,5 N/mm² 7,5 N/mm² 90 N/mm²	ECOTAL ECOMID* ECOFLON 2 ECOFLON 40% Bz. ECOFLON 60% Bz. ECOTEX ***
	Fo3 	**guide ring Fo3** for piston application. angled design combines guidering and back-up ring function. split and non split design available.	-50 °C ... +100 °C -40 °C ... +100 °C -200 °C ... +200 °C -200 °C ... +200 °C -200 °C ... +200 °C -40 °C ... +130 °C	4 m/s 4 m/s 4 m/s 5 m/s 5 m/s 1 m/s	25 N/mm² 25 N/mm² 3 N/mm² 4,5 N/mm² 7,5 N/mm² 90 N/mm²	ECOTAL ECOMID* ECOFLON 2 ECOFLON 40% Bz. ECOFLON 60% Bz. ECOTEX ***
	Fo4 	**guide ring Fo4** as profile Fo3 but for rod application.	-50 °C ... +100 °C -40 °C ... +100 °C -200 °C ... +200 °C -200 °C ... +200 °C -200 °C ... +200 °C -40 °C ... +130 °C	4 m/s 4 m/s 4 m/s 5 m/s 5 m/s 1 m/s	25 N/mm² 25 N/mm² 3 N/mm² 4,5 N/mm² 7,5 N/mm² 90 N/mm²	ECOTAL ECOMID* ECOFLON 2 ECOFLON 40% Bz. ECOFLON 60% Bz. ECOTEX ***
	Fo5 	**guide ring Fo5** with integrated collar on inside diameter, for piston application. split and non split design available.	-50 °C ... +100 °C -40 °C ... +100 °C -200 °C ... +200 °C -200 °C ... +200 °C -200 °C ... +200 °C -40 °C ... +130 °C	4 m/s 4 m/s 4 m/s 5 m/s 5 m/s 1 m/s	25 N/mm² 25 N/mm² 3 N/mm² 4,5 N/mm² 7,5 N/mm² 90 N/mm²	ECOTAL ECOMID* ECOFLON 2 ECOFLON 40% Bz. ECOFLON 60% Bz. ECOTEX ***
	Fo6 	**guide ring Fo6** with integrated collar on outside diameter, for rod application. split and non split design available.	-50 °C ... +100 °C -40 °C ... +100 °C -200 °C ... +200 °C -200 °C ... +200 °C -200 °C ... +200 °C -40 °C ... +130 °C	4 m/s 4 m/s 4 m/s 5 m/s 5 m/s 1 m/s	25 N/mm² 25 N/mm² 3 N/mm² 4,5 N/mm² 7,5 N/mm² 90 N/mm²	ECOTAL ECOMID* ECOFLON 2 ECOFLON 40% Bz. ECOFLON 60% Bz. ECOTEX ***
	Fo7 	**guide ring Fo7** with groove on inside diameter, for piston application. split and non split design available.	-50 °C ... +100 °C -40 °C ... +100 °C -200 °C ... +200 °C -200 °C ... +200 °C -200 °C ... +200 °C -40 °C ... +130 °C	4 m/s 4 m/s 4 m/s 5 m/s 5 m/s 1 m/s	25 N/mm² 25 N/mm² 3 N/mm² 4,5 N/mm² 7,5 N/mm² 90 N/mm²	ECOTAL ECOMID* ECOFLON 2 ECOFLON 40% Bz. ECOFLON 60% Bz. ECOTEX ***
	Fo8 	**guide ring Fo8** with groove on outside diameter, for rod application. split and non split design available.	-50 °C ... +100 °C -40 °C ... +100 °C -200 °C ... +200 °C -200 °C ... +200 °C -200 °C ... +200 °C -40 °C ... +130 °C	4 m/s 4 m/s 4 m/s 5 m/s 5 m/s 1 m/s	25 N/mm² 25 N/mm² 3 N/mm² 4,5 N/mm² 7,5 N/mm² 90 N/mm²	ECOTAL ECOMID* ECOFLON 2 ECOFLON 40% Bz. ECOFLON 60% Bz. ECOTEX ***

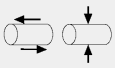
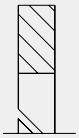
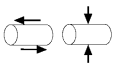
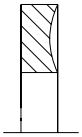
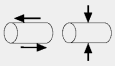
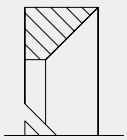
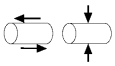
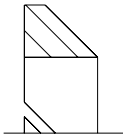
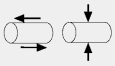
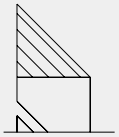
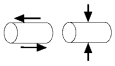
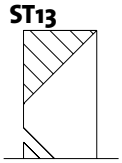
linear moving rotating oscillating spiral moving static

Not bolded symbols: please consult our technical dpmt. for application limitations

* ECOTAL up to ø260 mm, ECOMID above ø260 mm
** attention: not suitable for mineral oils !
*** ECOTEX: special fabric reinforced material

Back-up rings

Back-up profiles

Application	Profile	Description	Temperature	max.speed	Material
	**ST08** 	**back-up ring** common inactive back-up ring, mainly used with O-Rings to avoid gap extrusion. split and non split design available.	-50 °C ... +100 °C -40 °C ... +100 °C -200 °C ... +260 °C -200 °C ... +260 °C -30 °C ... +110 °C -20 °C ... +110 °C -50 °C ... +110 °C -30 °C ... +110 °C	- - - - - - - -	ECOTAL ECOMID* ECOFLON 1 ECOFLON 2 ECOPUR H-ECOPUR T-ECOPUR G-ECOPUR
	**ST09** 	**back-up ring** common inactive back-up ring especially for O-Rings to avoid gap extrusion. split and non split design available.	-200 °C ... +260 °C -30 °C ... +110 °C -20 °C ... +110 °C -50 °C ... +110 °C -30 °C ... +110 °C	- - - - -	ECOFLON 1 ECOPUR H-ECOPUR T-ECOPUR G-ECOPUR
	**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.	-50 °C ... +100 °C -40 °C ... +100 °C -200 °C ... +260 °C	- - -	ECOTAL ECOMID* ECOFLON 2
	**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.	-50 °C ... +100 °C -40 °C ... +100 °C -200 °C ... +260 °C	- - -	ECOTAL ECOMID* ECOFLON 2
	**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.	-50 °C ... +100 °C -40 °C ... +100 °C -200 °C ... +260 °C	- - -	ECOTAL ECOMID* ECOFLON 2
	**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.	-50 °C ... +100 °C -40 °C ... +100 °C -200 °C ... +260 °C	- - -	ECOTAL ECOMID* ECOFLON 2

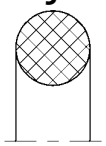
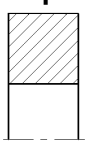
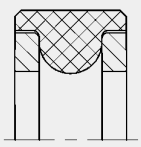
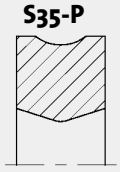
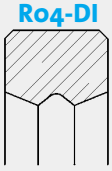
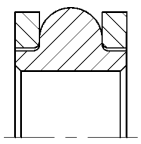
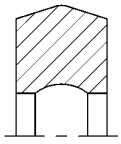
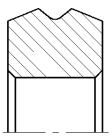
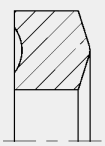
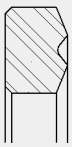
 linear moving
 rotating
 oscillating
 spiral moving
 static

* ECOTAL up to ø260 mm, ECOMID above ø260 mm

Not bolded symbols: please consult our technical dpmt. for application limitations

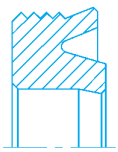
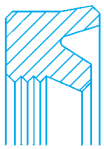
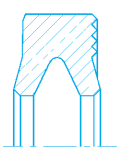
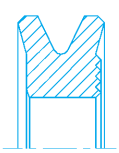
Static seals

Beside the conventional O-rings and square-rings Economos® offers a standard range of specialized seals for static applications. Most of below listed profiles fit in standard O-ring-grooves (housings) and can be substituted easily without any rework of housing dimensions.

Application	static	Profiles			
universal		**R13** 	**R14** 		**universal type** most common and simple seal profiles with proven reliability in multiple applications in every sector of industry.
inside sealing		**S20-R** 	**S35-P** 	**R04-DI** 	**inside sealing type** interference fit on outside diameter assures stable fit in the housing and reliable performance at all pressures.
outside sealing		**K20-R** 	**K35-P** 	**R05-DO** 	**outside sealing type** interference fit on inside diameter assures stable fit in the housing and reliable performance at all pressures.
axial sealing		**R35-A** 	**R20-P** 	**R20-DA** 	**axial sealing type** robust profiles mainly used as flange seals, inside or outside pressurizsation possible. direction of pressurization (from inside or outside) must be indicated when ordering the seal.

For material data, temperature- and pressure limitations please refer to the respective entries in the profile description.

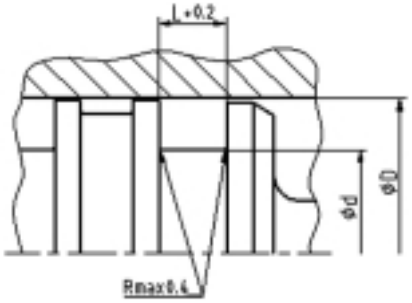
In addition to our standard range of static seals we certainly do offer special tailormade static seal profiles to satisfy the very specific needs of every customer, in every industry.

Special application	static	Profiles				
tailormade solutions						these special profiles are examples for our wide and flexible product range.

Piston seal housing details and recommendations

Indicated dimensions are required to process an order

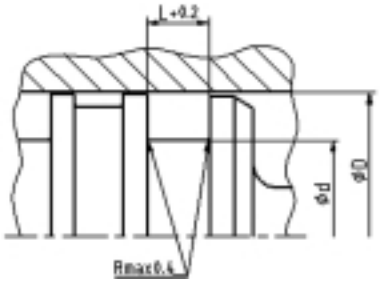
øD . . . . . outside diameter
ød . . . . . inside diameter
L . . . . . groove length



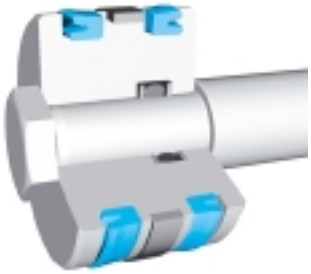
Surface roughness	Rtmax (µm)	Ra (µm)
Sliding surface for PU/RUBBER seals	≤2.5	≤0.1 - 0.5
Sliding surface for PTFE seals	≤2	≤0.05 - 0.3
Bottom of groove	≤6.3	≤1.6
Groove face	≤15	≤3
bearing area Tp	>50%	≤95%

Seal housing tolerances	
Ø d	h10
Ø D	H9

Easy ordering procedure	K01-P	H-ECOPUR	160 x 140 x 12
	profile	material	nominal housing dimensions



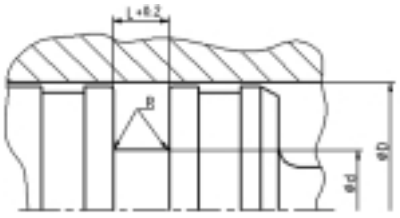
K01
K02
K03
K04
K05
K06
K07
K20



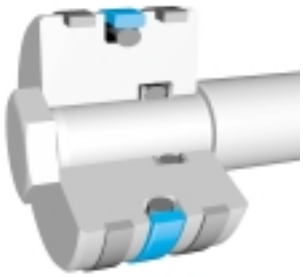
Main applications:
support- and retaining cylinders
standard cylinders

Advantages:
stable fit in the housing,
ultimate sealing effect,
wide temperature range

Standard Materials:
ECOPUR, ECORUBBER (all types)



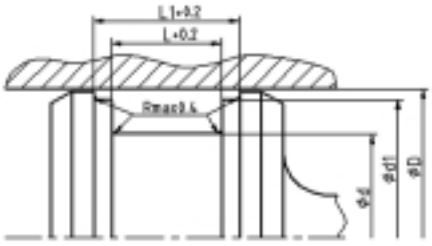
K08
K23



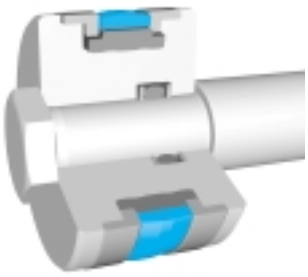
Main applications:
standard cylinders for positioning functions, mobile hydraulics, etc.

Advantages:
low friction, no stick-slip, excellent resistance against pressure shocks

Standard Materials:
ECOFLON / NBR or ECOFLON / Viton



K09
K17



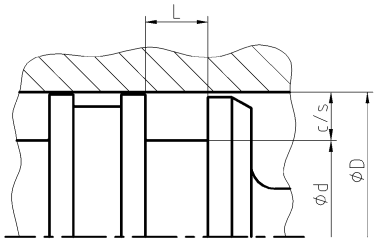
Main applications:
support- and retaining cylinders
standard cylinders

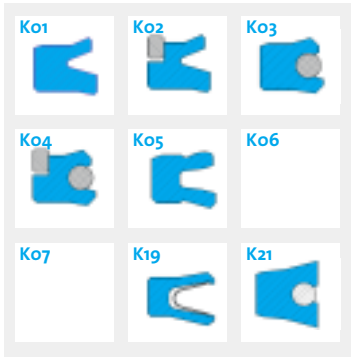
Advantages:
excellent static and dynamic sealing capacity, integrated guide rings

Standard Materials:
ECOPUR / ECORUBBER / ECOTAL

housing recommendations

single acting piston seals
lip type (u-cup) seals
compact seals



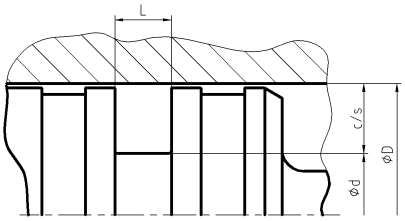


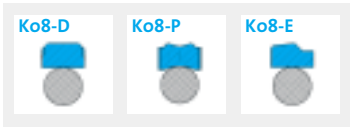
The listing below is our suggestion for standard housing dimensions. Please note that we are able to produce those profiles to your specific need or any non standard housing.

øD	ød	L	c/s
5 - 24,9	øD-8	6	4
25 - 49,9	øD-10	7	5
50 - 74,9	øD-12	8	6
75 - 149,9	øD-16	10	8
150 - 299,9	øD-20	12	10
300 - 500	øD-24	18	12
500 - 750	øD-30	20	15
> 750	øD-40	26	20

housing recommendations

single/double acting piston seals
o-ring activated PTFE (PU) seals



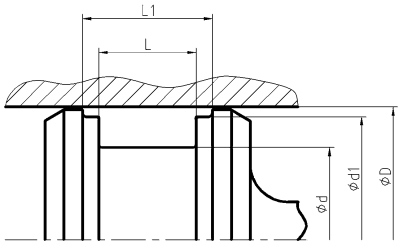


The listing below is our suggestion for standard housing dimensions. Please note that we are able to produce those profiles to your specific need or any non standard housing.

øD	ød	L	c/s
8-14,9	øD-4,9	2,2	2,45
15-39,9	øD-7,5	3,2	3,75
40-79,9	øD-11	4,2	5,5
80-132,9	øD-15,5	6,3	7,75
133 - 329,9	øD-21	8,1	10,5
330 - 669,9	øD-24,5	8,1	12,25
670 - 1.000	øD-28	9,5	14
> 1.000	øD-28	9,5	14

housing recommendations

double acting piston seals
compact type



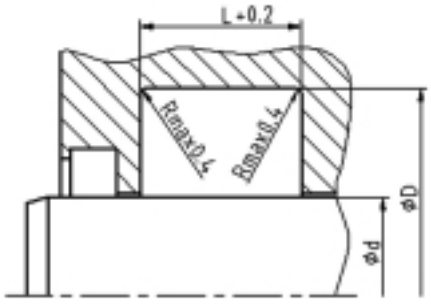
The listing below is our suggestion for standard housing dimensions. Please note that we are able to produce those profiles to your specific need or any non standard housing.

øD	ød	ød1	L	L1
20 - 49,9	øD-10	øD-3	12,5	20,5
50 - 79,9	øD-15	øD-4	20	28
80 - 149,9	øD-20	øD-5	25	36
155 - 399,9	øD-25	øD-6	32	46
400 - 750	øD-30	øD-8	36	50
>750	øD-40	øD-8	40	54

Rod seal housing details and recommendations

Indicated dimensions are required to process an order

øD ..... outside diameter
ød ..... inside diameter
L ..... groove length

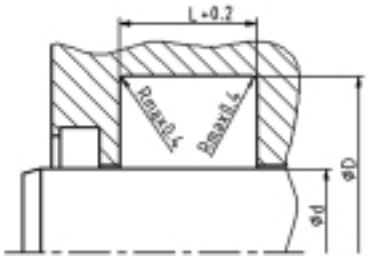


Surface roughness	R tmax (µm)	Ra (µm)
Sliding surface for PU/RUBBER seals	≤ 2.5	≤ 0.1 - 0.5
Sliding surface for PTFE seals	≤ 2	≤ 0.05 - 0.3
Bottom of groove	≤ 6.3	≤ 1.6
Groove face	≤ 15	≤ 3
bearing area Tp	> 50%	≤ 95%

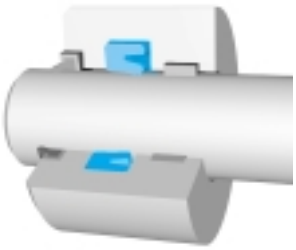
Seal housing tolerances

Ø d	f8
Ø D	H10

Easy ordering procedure	S01-P	ECOPUR	60 x 75 x 10
	profile	material	nominal housing dimensions



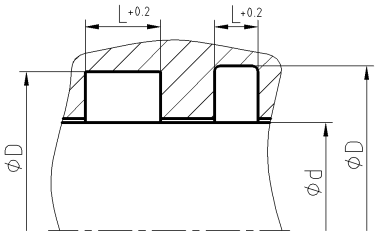
S01
S02 S17
S03 S18
S04 S19
S05 S35
S06
S07
S08



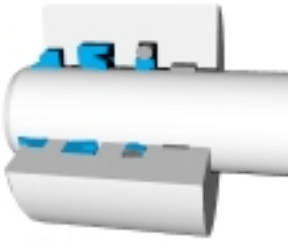
Main applications:
standard cylinders
light & standard hydraulic applications

Advantages:
stable fit in the housing, ultimate sealing effect, wide temperature range, good backpumping ability

Standard Materials:
ECOPUR, ECORUBBER



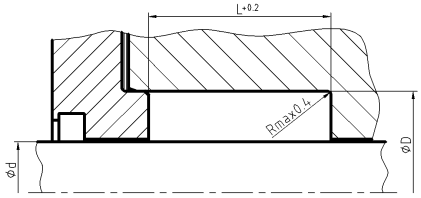
S09



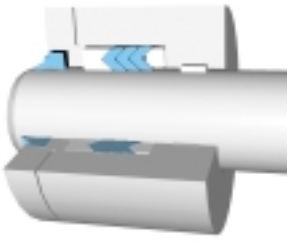
Main applications:
earth moving equipment,
heavy hydraulics

Advantages:
excellent resistance against pressure shocks, long lifetime

Standard Materials:
S09: ECOFLON / NBR or ECOFLON / VITON
S01: ECOPUR or ECORUBBER



S1012
S1315



Main applications:
heavy industry hydraulics, presses

Advantages:
suitable for old, worn rods, splitted version for easy installation available

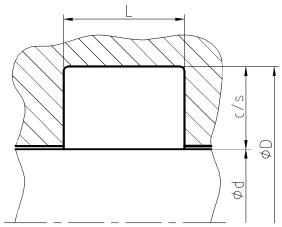
Standard Materials:
ECOPUR / ECOTAL

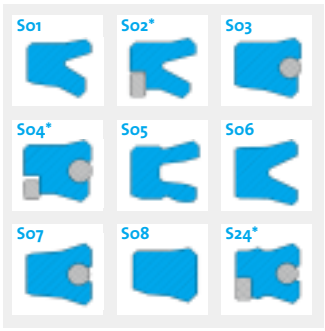
Profiles

housing recommendations

single acting rod seals
lip type (u-cup) seals
compact seals

The listing below is our suggestion for standard housing dimensions. Please note that we are able to produce those profiles to your specific need or any non standard housing.



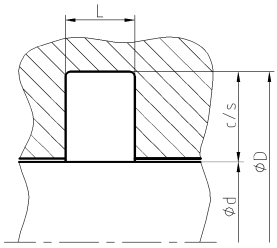


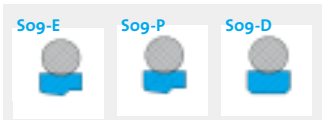
ød	øD	L	c/s
5 - 24,9 *	ød+8	6,3	4
25 - 49,9	ød+10	8	5
50 - 149,9	ød+15	10	7,5
150 - 299,9	ød+20	14	10
300 - 499,9	ød+25	17	12,5
500 - 699,9	ød+30	25	15
700 - 1.000	ød+40	32	20
> 1.000	ød+40	32	20

housing recommendations

single/double acting rod seals
O-ring activated PTFE (PU) seals

The listing below is our suggestion for standard housing dimensions. Please note that we are able to produce those profiles to your specific need or any non standard housing.



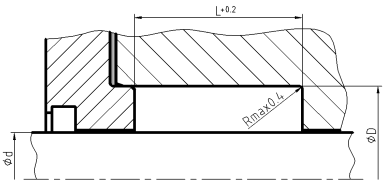


ød	øD	L	c/s
5 - 7,9	ød+4,9	2,2	2,45
8 - 18,9	ød+7,3	3,2	3,65
19 - 37,9	ød+10,7	4,2	5,35
38 - 199,9	ød+15,1	6,3	7,55
200 - 255,9	ød+20,5	8,1	10,25
256 - 649,9	ød+24	8,1	12
650 - 1.000	ød+27,3	9,5	13,65
> 1.000	ød+27,3	9,5	13,65

housing recommendations

single acting rod seals
chevron packings

The listing below is our suggestion for standard housing dimensions. Please note that we are able to produce those profiles to your specific need or any non standard housing.



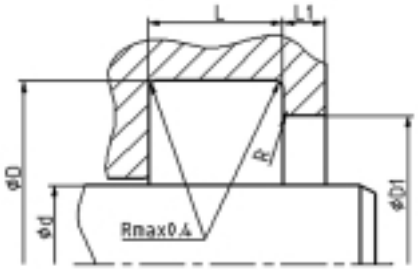
ød	øD	L	c/s
10 - 39,9	ød+10	16	5
40 - 74,9	ød+15	25	7,5
75 - 149,9	ød+20	32	10
150 - 199,9	ød+25	40	12,5
200 - 300	ød+30	50	15
> 300	ød+40	63	20

* Restrictions in minimum diameter for profiles with back-up rings.
Please consult our technical dpmt. for exact limitations.

Wiper housing details and recommendations

Indicated dimensions are required to process an order

øD ..... outside diameter
ød .....inside diameter (rod)
L ..... groove length
H ..... total wiper height

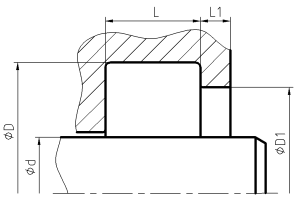


Surface roughness	R tmax (µm)	Ra (µm)
Sliding surface for PU/RUBBER seals	≤2.5	≤0.1 - 0.5
Sliding surface for PTFE seals	≤ 2	≤0.05 - 0.3
Bottom of groove	≤6.3	≤1.6
Groove face	≤15	≤3
bearing area Tp	>50%	≤ 95%

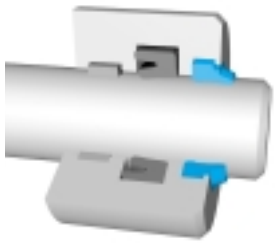
Seal housing tolerances

Ø D1	H11	L<10 mm	+0,2
Ø D	H11	L>10 mm	+0,3

Easy ordering procedure	A01	S-ECOPUR	60 x 68 x 4/7
	profile	material	nominal housing dimensions / total wiper height



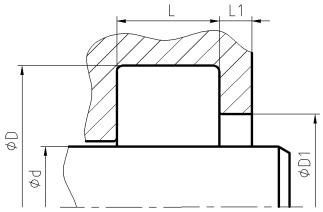
A01
A04



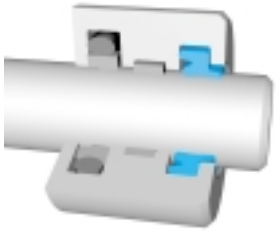
Main applications:
standard wiper for hydraulic

Advantages:
easy installation (snap-in)
excellent wear resistance,
technically accurate closure

Standard Materials:
ECOPUR / ECORUBBER



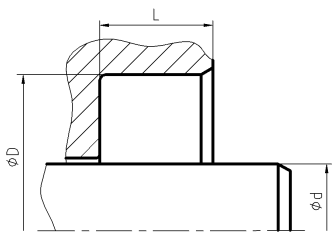
A11
A02
A05
A12



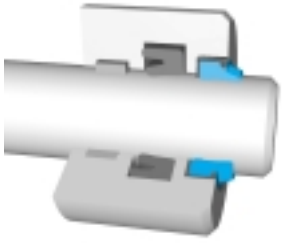
Main applications:
in combination with O-ring activated PTFE rod seals (S09)

Advantages:
excelllent wear resistance,
double acting function

Standard Materials:
ECOPUR / ECORUBBER



A03
A06



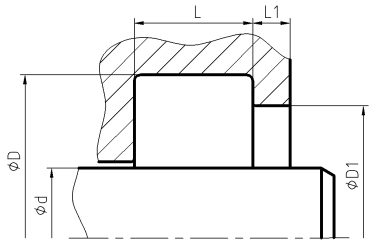
Main applications:
standard hydraulic applications,
pressfit for axially open housings

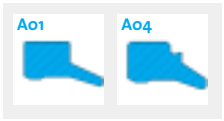
Advantages:
excellent wear resistance,
plastic retainer ring, no oxidation problem between retainer and housing

Standard Materials:
ECOPUR+ECOTAL / ECORUBBER+ECOTAL

housing recommendations
single acting wipers

The listing below is our suggestion for standard housing dimensions. Please note that we are able to produce those profiles to your specific need or any non standard housing.



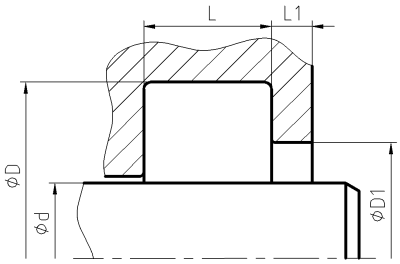


ød	øD	øD1	L	L1	H*
6 - 100	ød+8	ød+6	4	1	7
100,1 - 149,9	ød+12	ød+9	5,5	1,5	10
≥150	ød+15	ød+11	6,5	2	13

* H = total wiper height

housing recommendations
single/double acting wipers

The listing below is our suggestion for standard housing dimensions. Please note that we are able to produce those profiles to your specific need or any non standard housing.

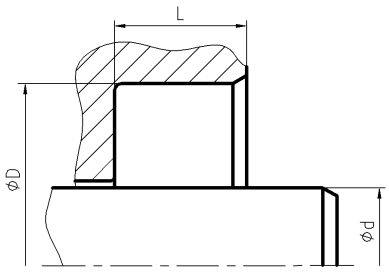


ød	øD	øD1	L	L1	H*
6 - 49,9	ød+8	ød+4	5	min. 2	8
50 - 99,9	ød+10	ød+5	6	min. 2	9,7
≥100	ød+15	ød+7,5	8,5	min. 2	13

* H = total wiper height

housing recommendations
single acting wipers

The listing below is our suggestion for standard housing dimensions. Please note that we are able to produce those profiles to your specific need or any non standard housing.



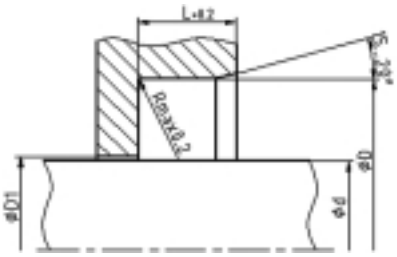
ød	øD	L	H*
6 - 9,9	ød+8	5	8
10 - 99,9	ød+10	7	10
100 - 200	ød+15	9	12
> 200	ød+20	12	16

* H = total wiper height

rotary seal housing details and recommendations

Indicated dimensions are required to process an order

øD ..... outside diameter
ød ..... inside diameter (shaft)
L ..... groove length

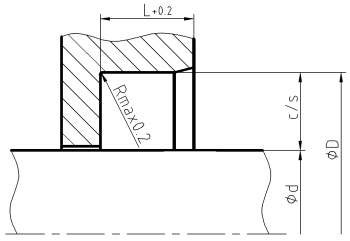


Surface roughness	R tmax (µm)	Ra (µm)
Sliding surface for PU/RUBBER seals	≤ 2.5	≤ 0.1 - 0.5
Sliding surface for PTFE seals	≤ 2	≤ 0.05 - 0.3
Bottom of groove	≤ 6.3	≤ 1.6
Groove face	≤ 15	≤ 3
bearing area Tp	> 50%	≤ 95%

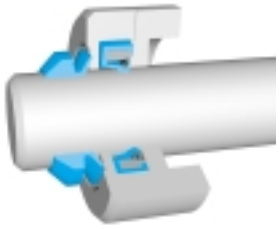
Seal housing tolerances

Ø d	f8
Ø D	H8

Easy ordering procedure	R01	ECORUBBER 1 / ECOTAL	60 x 80 x 10
	profile	material	nominal housing dimensions



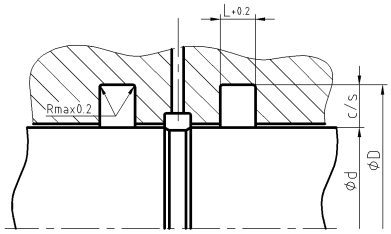
R01
R02



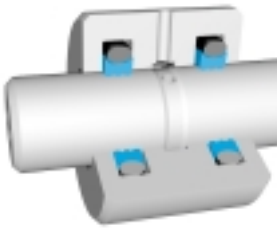
Main applications:
bearing protection

Advantages:
good adaptation possibilities for diverse temperatures and media

Standard Materials:
ECOPUR, ECORUBBER / ECOTAL, Aluminium



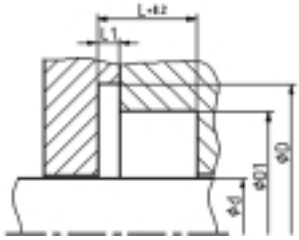
R09



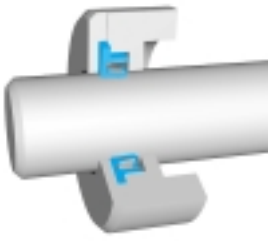
Main applications:
rotary pivots

Advantages:
for high pressure

Standard Materials:
ECOFLON + NBR or Viton



R19



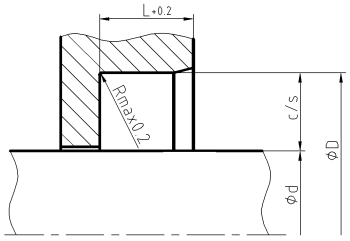
Main applications:
bearing protection for chemical and pharma industries

Advantages:
low friction, good chemical and thermal resistance, suitable for high speed

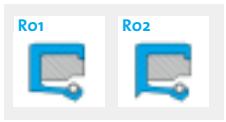
Standard Materials:
ECOFLON, stainless steel spring

housing recommendations

single acting rotary seals
oil seals / radial shaft seals



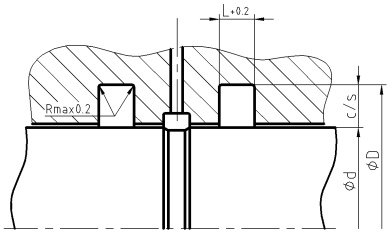
The listing below is our suggestion for standard housing dimensions. Please note that we are able to produce those profiles to your specific need or any non standard housing.



ød	øD	L	c/s
6 - 59,9	ød+12	7	6
60 - 139,9	ød+15	8	7,5
140 - 299,9	ød+20	10	10
300 - 499,9	ød+30	12	15
500 - 800	ød+40	20	20
> 800	ød+50	22	25

housing recommendations

double acting rotary seals
O-ring activated PTFE seals

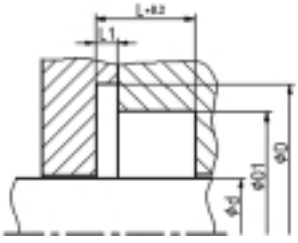


The listing below is our suggestion for standard housing dimensions. Please note that we are able to produce those profiles to your specific need or any non standard housing.

ød	øD	L	c/s
6 - 18,9	ød+4,9	2,2	2,45
19 - 37,9	ød+7,5	3,2	3,75
38 - 199,9	ød+11	4,2	5,5
200 - 255,9	ød+15,5	6,3	7,75
256 - 649,9	ød+21	8,1	10,5
>650	ød+28	9,5	14

housing recommendations

single acting rotary seals
Spring activated PTFE seals



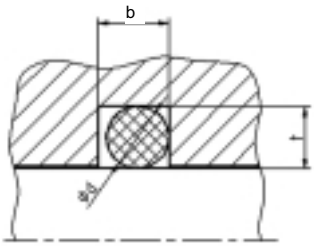
The listing below is our suggestion for standard housing dimensions. Please note that we are able to produce those profiles to your specific need or any non standard housing.

ød	øD	øD1	L	L1
5 - 19,9	ød+9	ød+5	3,6	0,85
20 - 39,9	ød+12,5	ød+7	4,8	1,35
40 - 399,9	ød+17,5	ød+10,5	7,1	1,8
≥ 400	ød+22	ød+14	9,5	2,8

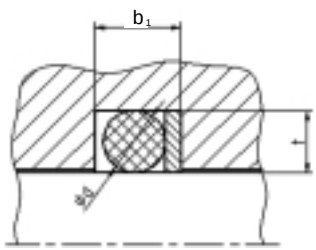
O-ring housing details and recommendations

O-Ring housing recommendations for static applications

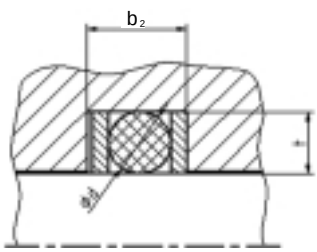
direction of pressure



direction of pressure



direction of pressure



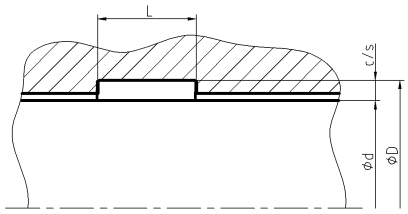
cord (mm)	groove (mm)	without back-up ring (mm)	one back-up ring (mm)	2 back-up rings (mm)	recommended back-up ring width (mm)
Ø d	t ± 0,05	b + 0,25	b1 + 0,25	b2 + 0,25	
1,5	1,10	2,1	3,1	4,1	1,0
1,78	1,35	2,5	3,5	4,5	1,0
2,00	1,56	2,7	4,2	5,7	1,5
2,50	2,05	3,3	4,8	6,3	1,5
2,62	2,18	3,5	5,0	6,5	1,5
3,00	2,52	3,9	5,4	6,9	1,5
3,50	3,00	4,4	5,9	7,4	1,5
3,53	3,00	4,4	5,9	7,4	1,5
4,00	3,40	5,0	6,7	8,4	1,7
5,00	4,25	6,3	8,0	9,7	1,7
5,33	4,53	6,7	8,4	10,1	1,7
5,70	4,85	7,1	9,1	11,1	2,0
6,00	5,10	7,5	9,5	11,5	2,0
6,99	5,94	8,8	10,8	12,8	2,0
7,00	5,95	8,8	10,8	12,8	2,0
8,00	6,80	10,0	12,5	15,0	2,5
10,00	8,50	12,5	15,0	17,5	2,5

guide ring housing details and recommendations

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

housing recommendations
guide rings rod

The listing below is our suggestion for standard housing dimensions. Please note that we are able to produce those profiles to your specific need or any non standard housing.

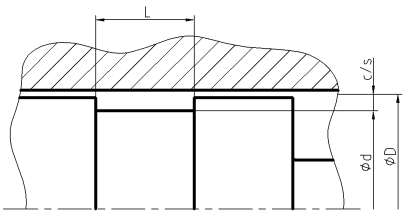


Fo1

ød	øD	L	c/s
6 - 29,9	ød+3	4	1,5
30 - 49,9	ød+3	5,6	1,5
50 - 99,9	ød+5	9,7	2,5
100 - 799,9	ød+5	15	2,5
800 - 1.000	ød+8	25	4
>1.000	ød+8	25	4

housing recommendations
guide rings piston

The listing below is our suggestion for standard housing dimensions. Please note that we are able to produce those profiles to your specific need or any non standard housing.



Fo1

øD	ød	L	c/s
6 - 29,9	øD-3	4	1,5
30 - 49,9	øD-3	5,6	1,5
50 - 99,9	øD-5	9,7	2,5
100 - 799,9	øD-5	15	2,5
800 - 1.000	øD-8	25	4
>1.000	øD-8	25	4

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