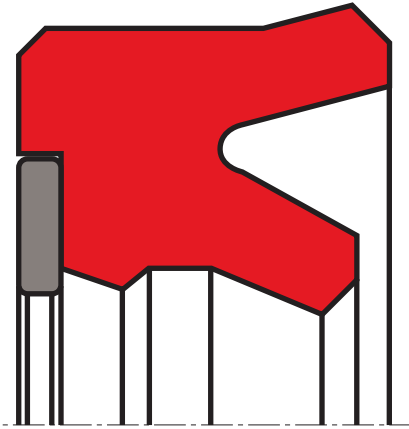


rod seal S18-R

seal spec

**description**

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.

- asymmetric single-acting rod lip seal, with the dynamic sealing lip being shorter than the static one.
- interference fit on the outside diameter.
- various materials are available for different purposes.
- snaps into simple grooves (see notes on installation).
- best sealing effect across a wide temperature range.
- the active back up ring on the trailing side of the seal reduces extrusion wear and allows larger gap dimensions.
- for pressures up to 250 bar as a seal between pressurised space and atmosphere.
- good sealing in the low pressure range.
- excellent static and dynamic sealing.
- the secondary lip reduces the residual oil film.

application

not bolded symbols; please consult our technical for application limitations

category of profile

machined only.

single acting

the S18-R seal is designed for use as a rod seal.

area of application: hydraulics

- reciprocating rods on hydraulic cylinders, push rods, fittings.
- as rod seal with large extrusion gap and without specific impact load.
- commonly used as sealing element in telescopic cylinders (for large deflections increased preload may be necessary).

note

- this seal has the correct functioning dimension only when mounted. when slipping the seal over the piston rod, it may appear too big.
- the ratio between nominal width and sealing height cs/H should not drop below a value of 1/1.4, small cross sections demand values up to 1/1.6.
- recovery volume is limited.
- on long strokes drag pressure may be built up between both lips, which can lead to disfunction.

function

S18-R profiles are lip seals designed to seal pressurised space against the atmosphere; mainly for reciprocating movements. the secondary lip on the back ensures a increased stability in the housing. the design is based on application in standard hydraulic systems with conventional hydraulic oils. the operating parameters are as defined in the sealing data sheet and material data. requirements deviating from these parameters can be met to a certain degree by changing the geometry in the software program.



operating parameters & material

diameter range: up to 600 mm

material		temperature	max. surface speed	max. pressure ¹	hydrolysis	dry running	wear resistance
sealing element	back-up ring						
s-mart NBR	s-mart POM ²	-30 °C ... +100 °C	0,5 m/s	250 bar (25 MPa)	-	-	O
s-mart NBR	s-mart PA ²	-30 °C ... +100 °C	0,5 m/s	250 bar (25 MPa)	-	-	O
s-mart FKM	s-mart PTFE glass	-20 °C ... +200 °C	0,5 m/s	250 bar (25 MPa)	-	-	O
s-mart EPDM ³	s-mart POM ²	-50 °C ... +100 °C	0,5 m/s	250 bar (25 MPa)	++	-	O
s-mart EPDM ³	s-mart PA ²	-50 °C ... +100 °C	0,5 m/s	250 bar (25 MPa)	+	-	O
s-mart EPDM ³	s-mart PTFE glass	-50 °C ... +150 °C	0,5 m/s	250 bar (25 MPa)	++	-	O
s-mart HNBR	s-mart POM ²	-25 °C ... +100 °C	0,5 m/s	250 bar (25 MPa)	+	O	+
s-mart HNBR	s-mart PA ²	-25 °C ... +100 °C	0,5 m/s	250 bar (25 MPa)	+	O	+
s-mart HNBR	s-mart PTFE glass	-25 °C ... +150 °C	0,5 m/s	250 bar (25 MPa)	+	O	+

the stated operation conditions represent general indications. it is recommended not to use all maximum values simultaneously.
surface speed limits apply only to the presence of adequate lubrication film.

¹ pressure ratings are dependent on the size of the extrusion gap.

² POM up to ø260 mm, PA above ø260 mm.

³ attention: not suitable for mineral oils!

++ ... particularly suitable

o ... conditional suitable

+ ... suitable

- ... not suitable

for detailed information regarding chemical resistance please refer to our „list of resistance“. for increased wear resistance and higher pressure range polyurethane materials are to be preferred, attention should be paid to restrictions in chemical and thermal resistance. for higher gliding speeds another sealing system should be used (e.g. PTFE materials).

note on special materials:

as the temperature limits are determined by POM using special materials for the back up ring can expand the temperature limits.

gap dimension

operating pressure (MPa)	(ØD - Ød)/2 mm					
	4	5	7,5	10	12,5	15,0 mm
	max. permissible gap dimension					
50 bar (5 MPa)	0,75	1,00	1,50	2,00	2,50	3,00
100 bar (10 MPa)	0,75	1,00	1,40	1,62	1,80	2,20
150 bar (15 MPa)	0,75	0,85	1,10	1,30	1,50	1,75
200 bar (20 MPa)	0,60	0,75	0,90	1,10	1,25	1,30
250 bar (25 MPa)	0,50	0,65	0,75	0,80	1,00	1,15

important note:

the above data are maximum value and can't be used at the same time. e.g. the maximum operating speed depend on material type, pressure, temperature and gap value. temperature range also dependent on medium.

the diagram applies to an operating temperature of 70 °C.

surface quality

surface roughness	Rtmax (µm)	Ra (µm)
sliding surface	≤2,5	≤0,1-0,5
bottom of groove	≤6,3	≤1,6
groove face	≤15	≤3

tolerance recommendation

seal housing tolerances	
Ød	f8
ØD	H10

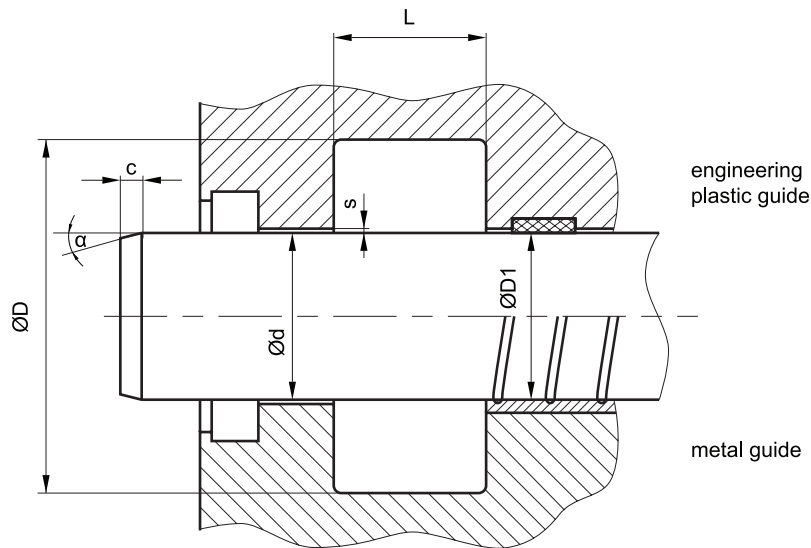
mode of installation

for inside diameters of 25 mm or more, and dependant on radial cross section (cs), the seals may be snapped into the housing.

Ød	type of installation
≤ 6•cs	open mounting space required
> 6•cs ≤ 10•cs	snap mounting with tool
> 10•cs	snap mounting by hand



recommended mounting space:



recommended guide tolerance D1:

d f8 [mm]	p ≤ 100 [bar]	100 < p ≤ 200 [bar]	p > 200 [bar]
≤ 100	H10	H8	H8
> 100 ≤ 200	H10	H8	H7
>200	H9	H8	H7

insertion chamfer:

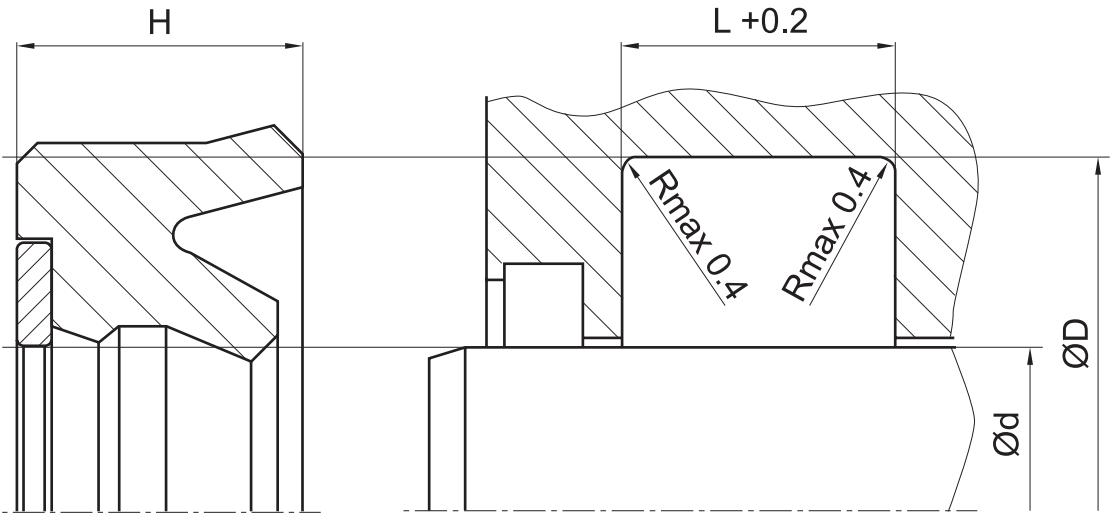
in order to avoid damage to the rod seal during installation, the piston rod is to be chamfered and rounded as shown in the “recommended mounting space” drawing. the size of chamfer depends on the seal type and profile width.

cs (mm)	c (mm)	
	α = 15° ... 20°	α = 20° ... 30°
4	3,5	2
5	4	2,5
6	4,5	3
8	5	4
10	6	5
12,5	8,5	6,5
15	10	7,5
20	13	10



seal & housing recommendations

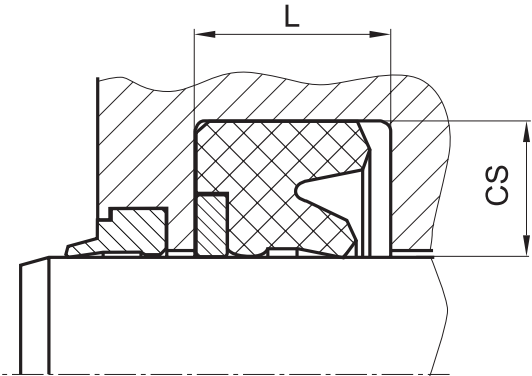
please note that we are able to produce those profiles to your specific need or any non standard housing. for detail measurements, please see seal-mart catalog...



the ratio between nominal width and seal height cs/H depends on the cross section. therefore we recommend the following housing heights.

$cs = (\varnothing D - \varnothing d)/2$ [mm]	L [mm]
4	8
5	9
6	11
7,5	14
10	17
12,5	20
15	25
20	32

fitted:



*don't hesitate to contact our technical department for further information or for special requirements (temperature, speed etc.), so that suitable materi-
als and/or designs can be recommended.*