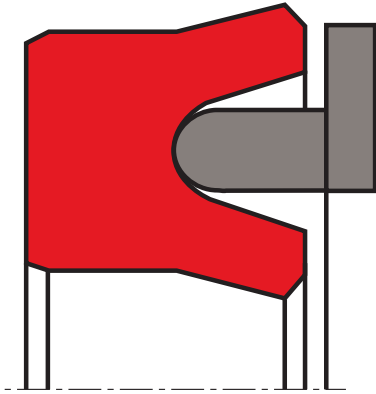


rod seal S22-P

seal spec



description

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.

- symmetric single-acting rod seal.
- no interference fit on the outside diameter.
- various materials are available for different purposes.
- sealing effect across a wide temperature range.
- sealing effect enhanced by high recovery.
- for pressures up to 400 bar as a seal between pressurised space and atmosphere.
- good sealing in the low pressure range.
- excellent static and dynamic sealing.
- suitable for long travel.
- little inclination to "stick-slip".
- small break-away load after prolonged periods of standstill.
- the stabilisation of the sealing element in the housing is achieved by a retainer ring.
- this retainer ring can be designed straight or as a angled ring (for easier centering and installation). the straight design has to be furnished with pressure relief grooves, the angled design needs balancing holes (for details see "fabrication tolerances for machined seals", ES 222.222).

application



not bolded symbols; please consult our technical for application limitations

category of profile

machined only.

single acting

the S22-P seal is designed for use as a rod seal.

area of application: hydraulics

- reciprocating rods on hydraulic cylinders, push rods, fittings and plungers.
- as rod seals for applications with small extrusion gap and without specific impact load.
- can also be used as a pivot seal in the case of small loads.
- repair seal for older equipment.
- replacement for rubber fabric seals of older equipment.

note

- under certain operating conditions, this seal may "pump" via the trailing side, i.e. as it does not fit tightly on the outside diameter, small amounts of operating media may be pressed out when the seal is deformed under pressure which may appear to be leakage.
- open housings required.
- not suitable for new designs (new style S01-P should be preferred).

function

S22-P profiles are lip seals designed to seal pressurised space against the atmosphere; mainly for reciprocating movements. 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 PU	s-mart POM / s-mart PA ²	-30 °C ... +100 °C	0,5 m/s	400 bar (40 MPa)	-	+	++
s-mart HPU	s-mart POM / s-mart PA ²	-20 °C ... +100 °C	0,5 m/s	400 bar (40 MPa)	+	+	++
s-mart LTPU	s-mart POM / s-mart PA ²	-50 °C ... +100 °C	0,5 m/s	400 bar (40 MPa)	-	+	++
s-mart SPU	s-mart POM / s-mart PA ²	-20 °C ... +100 °C	0,7 m/s	400 bar (40 MPa)	+	++	++
s-mart GPU	s-mart POM / s-mart PA ²	-30 °C ... +100 °C	0,5 m/s	400 bar (40 MPa)	+	+	++

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

++ ... particularly suitable

o ... conditional suitable

+ ... suitable

- ... not suitable

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

gap dimension

operating pressure	cs = (ØD - Ød)/2 mm					
	4	5	7,5	10	12,5	15
	safe extrusion gap (mm)					
100 bar (10 MPa)	0,18	0,22	0,32	0,38	0,45	0,53
200 bar (20 MPa)	0,12	0,16	0,25	0,33	0,40	0,45
300 bar (30 MPa)	0,07	0,13	0,21	0,28	0,36	0,42
400 bar (40 MPa)	0,05	0,10	0,19	0,26	0,33	0,39

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.

use larger cross sections to increase maximum allowed gap dimension.

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

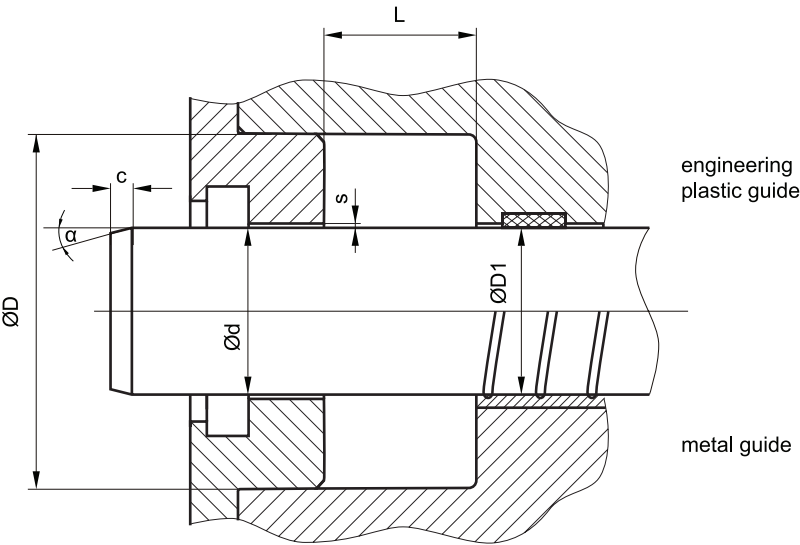
seal housing tolerances	
Ød	f8
ØD	H10

mode of installation

open housings are required.



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:

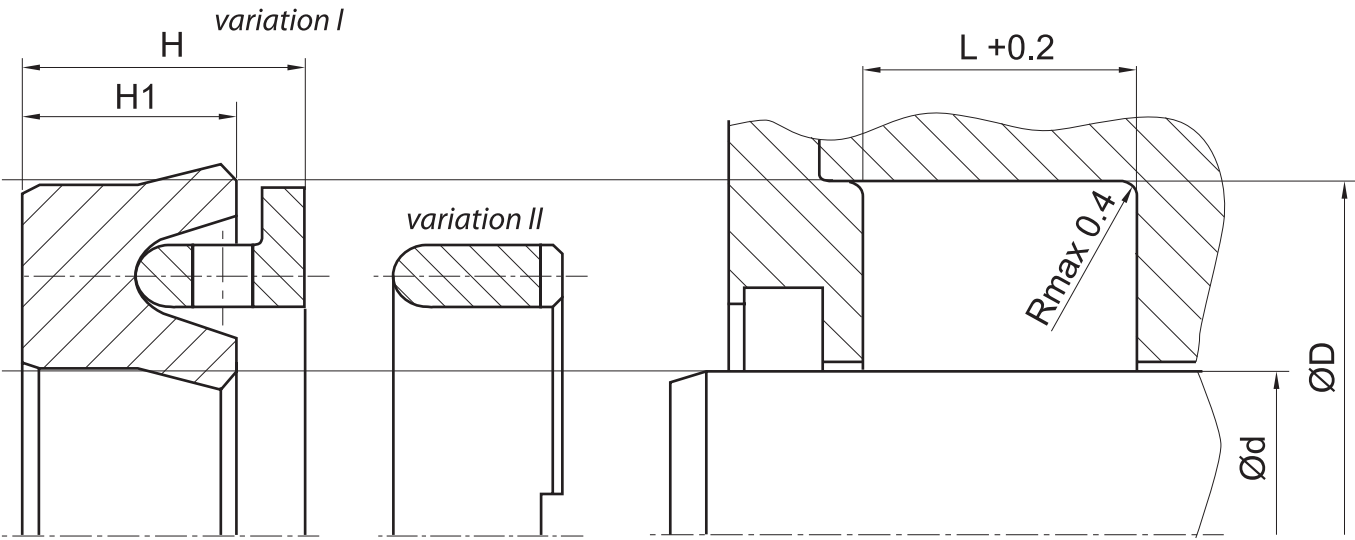
in order to avoid damage to the rod seal during installation, the piston rod is to be chamfered and rounded as shown in the “recommended mounting space” drawing. the size of chamfer depends on the seal type and profile width.

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



seal & housing recommendations

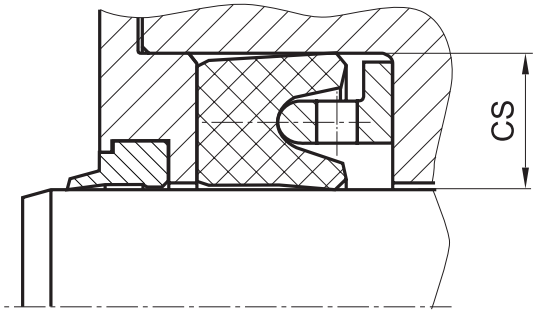
please note that we are able to produce those profiles to your specific need or any non standard housing. for detail measurements, please see seal-mart catalog...



the ratio between nominal with and seal height cs/H should not drop below 1/1.25. therefore we recommed the following housing heights.

$cs = (\varnothing D - \varnothing d)/2$ [mm]	L [mm]
4	6,3
5	8
6	9
7,5	10
10	14
12,5	17
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 materials and/or designs can be recommended.