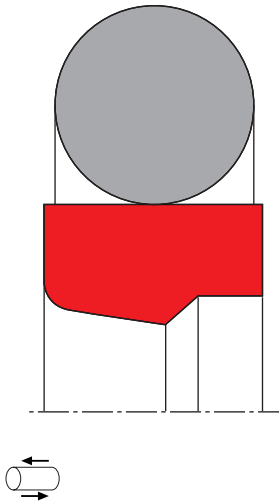


SEAL SPEC

S09-P



description

o-ring activated asymmetric PU rod seal with excellent dynamic sealing capacity. used secondary seal in tandem design (together with primary S09-E) to minimize residual oil film. for mobile hydraulics, injection moulding machines, heavy hydraulics.

- + asymmetric single acting composite rod seals, with a gliding part made of excellent wear resistant polyurethane and an elastic preload element.
- + interference fit on the outside diameter.
- + various materials are available for different purposes.
- + mostly used in a sealing system as secondary seal in combination with a PTFE gliding part composite seal S09-E (same housing) to minimize the resident oil film, a double wiper is not needed.
- + for secondary sealing systems this seal can take sole sealing function.
- + snaps into simple grooves (see notes on installation).
- + the free space on the trailing side reduces the risk of gap extrusion.
- + highest degree of sealing across a wide temperature range.
- + good static and dynamic sealing.
- + suitable for short and long travel. no stick-slip
- + for pressures up to 250 bar as a seal between pressurised space and atmosphere.
- + suitable for short and long travel with extremely slow or quick movements.

category of profile

machined product only

single acting

the S09-P seal is designed for use as a rod seal.

area of application; hydraulics

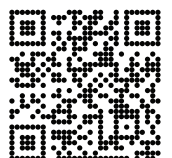
- reciprocating rods on hydraulic cylinders, small swivelling motion permissible.
- as secondary rod seal in tandem arrangement for positioning tasks for machine tools and robots.
- for heavy-duty operating conditions, profile S09-ES is preferred.
- dimensions according to ISO 7425 part 2 are common, as well as standard types that differ slightly in the depth of the mounting space. for specific dimensions see "range of profile sizes".
- in secondary sealing systems as single seal can take sole sealing function.

note

- the calculation program is based on mounting spaces according to ISO 7425, part 2. intermediate sizes are possible, with an o-ring for standard sizes. for deviating dimensions choose a different profile.
- for tandem arrangement, there should be enough space for trailing oil, between the seals.
- there should be enough space for trailing oil.
- the recovery capacity depends on the sealing system.

function

S09-P profiles are composite rod 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 parameter & material

sealing element	material energizer	back-up ring	temperature	max surface speed	max pressure ¹	hydrolysis	dry running	wear resistance
PU	NBR (70 shore A)	-	-30 °C ... +100 °C	1,0 m/s	250 bar (25 MPa)	-	+	++
HPU	NBR (70 shore A)	-	-20 °C ... +100 °C	1,0 m/s	250 bar (25 MPa)	-	+	++
LTPU	NBR (70 shore A)	-	-30 °C ... +100 °C	1,0 m/s	250 bar (25 MPa)	-	+	++
SPU	NBR (70 shore A)	-	-20 °C ... +100 °C	1,4 m/s	250 bar (25 MPa)	-	++	++
GPU	NBR (70 shore A)	-	-30 °C ... +100 °C	1,0 m/s	250 bar (25 MPa)	-	+	++

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

++ particularly suitable

+ suitable

o conditional suitable

- not suitable

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.

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).

note on special material:

as temperature limit and chemical resistance are determined by the preload element, the temperature range can be increased and the resistance to chemical influences improved, if a special material is used for the preload element.

gap dimension

operating pressure	cs = (ØD - Ød)/2 mm					
	2,45	3,65	5,35	7,55	10,25	12
safe extrusion gap (mm)						
50 bar (5 MPa)	0,30	0,35	0,45	0,55	0,60	0,70
100 bar (10 MPa)	0,25	0,30	0,35	0,35	0,45	0,55
150 bar (15 MPa)	0,20	0,25	0,25	0,30	0,35	0,40
200 bar (20 MPa)	0,15	0,20	0,20	0,25	0,30	0,35
250 bar (25 MPa)	0,10	0,15	0,15	0,20	0,26	0,30

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 tolerance	
Ød	f8
ØD	H10

mode of installation

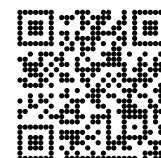
Ød	type of installation
≤ 6·cs	open mounting space required
> 6·cs ≤ 10·cs	snap mounting with tool
> 10·cs	snap mounting by hand

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

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.

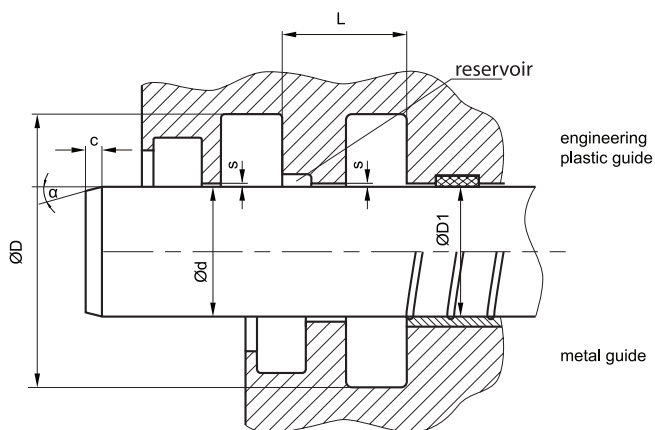
cs (mm)	c (mm)	
	α = 15° ... 20°	α = 20° ... 30°
2,45	2,5	1,5
3,65	3,5	2
5,35	4,5	3
7,55	5	3,5
10,25	6	5
12	8	6



SEAL SPEC S09-P



recommended mounting space



	secondary seal	secondary seal
version 1	S09-E	S09-P
version 2	S09-P	-

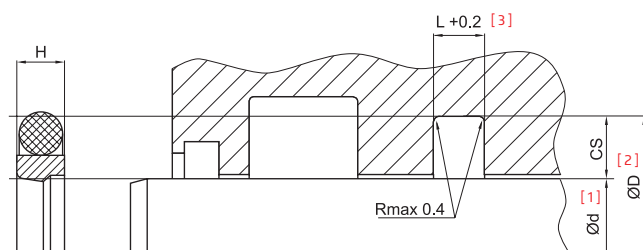
two types of mounting space are recommended depending on application: the choice of the sealing system does not depend on the guide elements.

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

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...



Ød [mm] [1]	L [mm] [3]	cs = (ØD - Ød)/2 [mm]
5 ~ 7,9	2,2	2,45
8 ~ 18,9	3,2	3,55
19 ~ 37,9	4,2	5,35
38 ~ 199,9	6,3	7,55
200 ~ 255,9	8,1	10,25
256 ~ 649,9	8,1	12

the ratio between nominal width and seal height should be in accordance to ISO 7425 part 2. we recommend the following values

fitted

