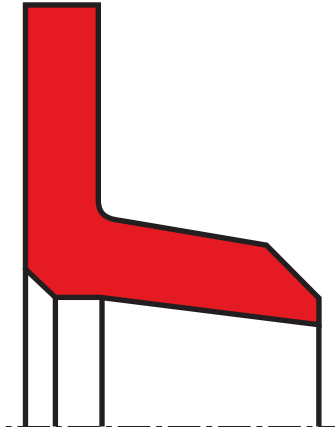


## rod seal S16-A

## seal spec



### description

simple hat seal, usually fixed in housing with clamp flange. mainly used for replacement in old hydraulic and pneumatic cylinders or for secondary applications.

- asymmetric single acting rod lipseals.
- the profile is clamped at the flange, thereby ensuring stability and static sealing effect.
- various materials are available for different purposes.
- sealing effect across a wide temperature range.
- radial inaccuracy or excentricity can be compensated by varying the length of the lip.
- for pressures up to 160 bar as a seal between pressurised space and atmosphere, pivoting and rotary movement and also long seal lips allow only lower pressure values.
- design A with chamfer, design B with radius (depending on housing).
- suitable for long travel.
- seal lip length affects to "stick-slip" behavior.
- low break-away load after prolonged periods of standstill.
- mainly used as a replacement in older pneumatic or hydraulic cylinders.

### application



not bolded symbols; please consult our technical for application limitations

### category of profile

machined or molded/standard/trade product.

### single acting

the S16-A seal is designed for use as a rod seal.

### area of application: hydraulics

- reciprocating rods on hydraulic and pneumatic cylinders, push rods and fittings.
- rod seal for applications with small extrusion gap and without special impact load.
- replacement for old leather seals.
- can also be used in rotating and pivoting applications at low loads (see also materials).

### note

- special designed mounting space is required.
- complicated installation.
- do not use for new designs.
- housings with integrated radius on the non pressurised side (common for old leather seals) do not allow design A.

### function

S16-A and S16-B profiles are lip seals with clamp flange (also referred to as "hat seal"), designed to seal pressurised space against the atmosphere; mainly for reciprocating, but also for minor rotating and pivoting movements. the design is based on application in standard hydraulic systems with conventional hydraulic oils, the use in pneumatic systems is quite common as well. 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 <sup>1</sup>	hydrolysis	dry running	wear resistance
s-mart PU	-30 °C ... +110 °C	0,5 m/s	160 bar (16 MPa)	-	+	++
s-mart HPU	-20 °C ... +110 °C	0,5 m/s	160 bar (16 MPa)	++	+	++
s-mart LTPU	-50 °C ... +110 °C	0,5 m/s	160 bar (16 MPa)	-	+	++
s-mart SPU	-20 °C ... +110 °C	0,7 m/s	160 bar (16 MPa)	++	++	++
s-mart NBR	-30 °C ... +100 °C	0,5 m/s	160 bar (16 MPa)	-	-	O
s-mart FKM	-20 °C ... +200 °C	0,5 m/s	160 bar (16 MPa)	-	-	O
s-mart EPDM <sup>2</sup>	-50 °C ... +150 °C	0,5 m/s	160 bar (16 MPa)	++	-	O
s-mart HNBR	-25 °C ... +150 °C	0,5 m/s	160 bar (16 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.

<sup>1</sup> pressure ratings are dependent on the size of the extrusion gap.

++ ... 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, polyurethan materials increase wear resistance. for higher gliding speeds another system should be used (e.g. PTFE materials)

**operating parameters for rotating applications**

	PU	rubber
maximum gliding speed [m/s]	2	3
maximum pressure [bar]	7	5

these values are not valid for continous duty and strongly depending on the lip geometry. they are not to be used simultaneously. we also recommend contacting our technical department.

**gap dimension**

operating pressure	(ØD - Ød)/2 mm					
	4	5	7,5	10	12,5	15,0 mm
	max. permissible gap dimension					
50 bar (5 MPa)	0,20	0,22	0,28	0,32	0,35	0,38
100 bar (10 MPa)	0,18	0,20	0,25	0,28	0,30	0,35
160 bar (16 MPa)	0,15	0,18	0,22	0,24	0,25	0,32

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**

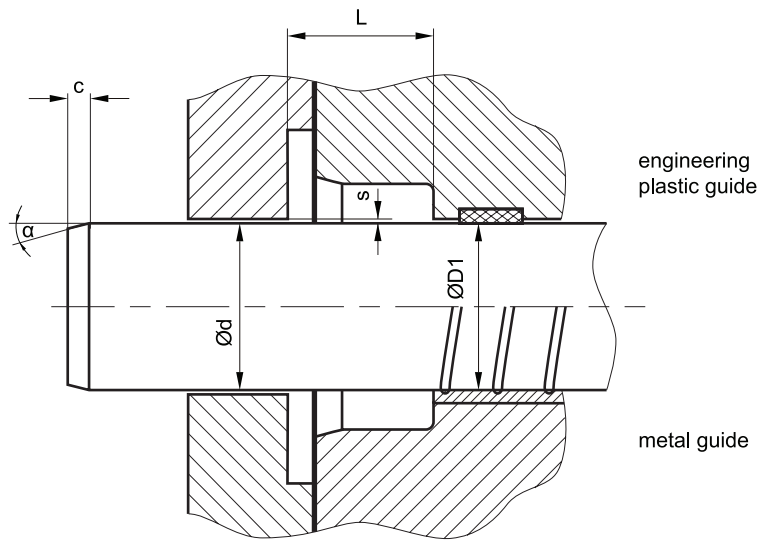
seal housing tolerances	
Ød	f8
ØD1	H12
ØD	H10

**mode of installation**

special shaped, open housings are required. the axial compression of the flange should not exceed 5 to 10% of the height, a clamping torque limitation should be arranged. to avoid twisting in the sealing lip, the compression should occur only at the clamp flange.



recommended mounting space:



recommended guide tolerance D1:

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

insertion chamfer:

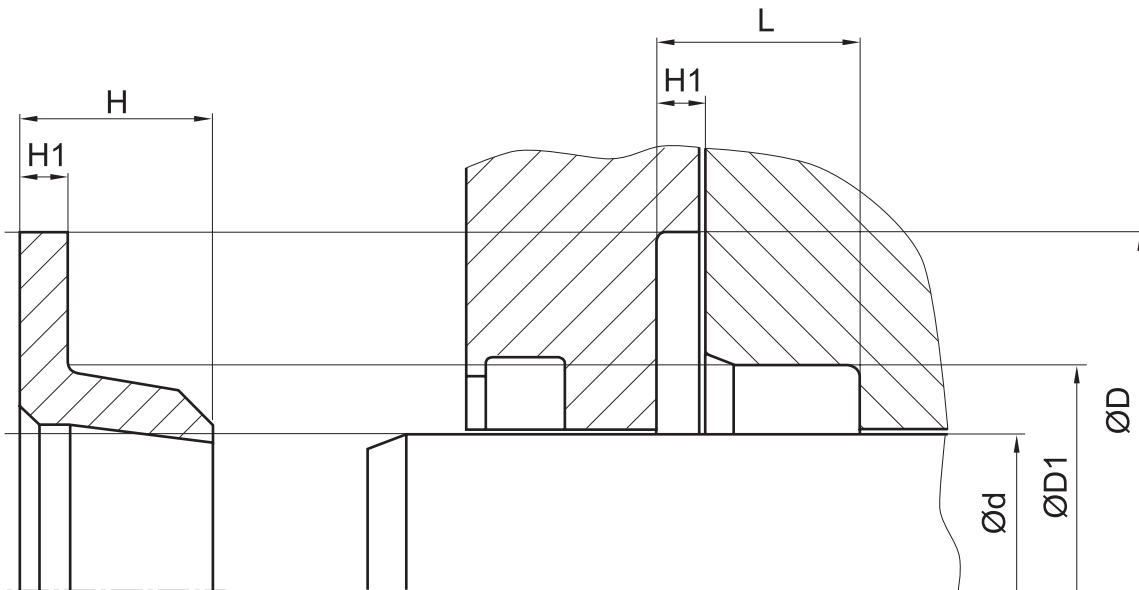
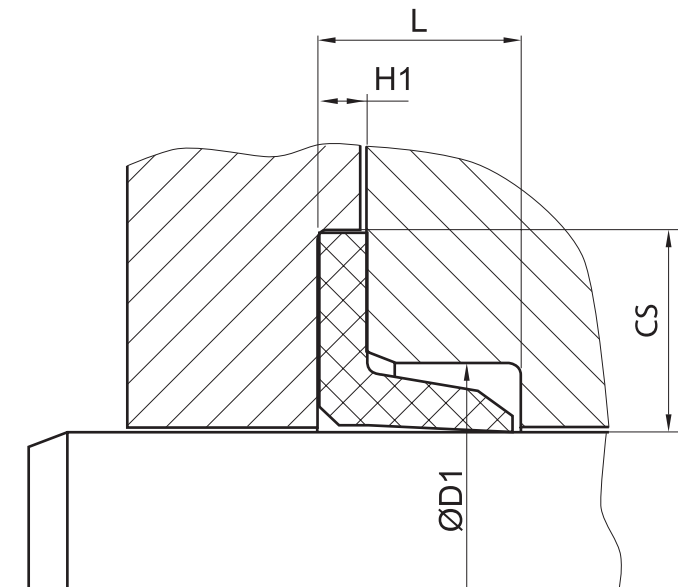
in order to avoid damage to the rod seal during installation, the piston rod is to be chamfered and rounded as shown in the “recommended mounting space” drawing. the size of chamfer depends on the seal type and profile width.

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**

this profile should only be used as a replacement in already existing mounting spaces. use modern sealing systems for new designs.

*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...*

**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.*