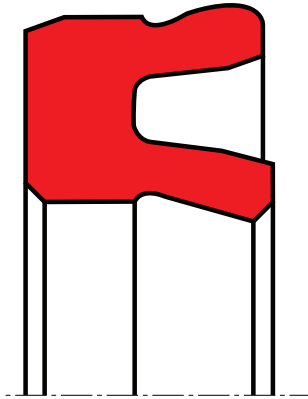


piston seal K05-R

seal spec



description

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.

- asymmetric single-acting piston lip seals, with the dynamic sealing lip being shaped differently than the static one.
- nominal dimension on inside diameter.
- various materials are available for varying applications.
- snaps into simple grooves (see notes on installation).
- best sealing effect across a wide temperature range.
- sealing effect enhanced by high recovery rate of the lubricant.
- the specific geometry supports the maintenance of the initial lubricating film thereby avoiding dry-running.
- for pressures up to 25 bar as a seal between pressurised spaces.
- good sealing in the low pressure range.
- excellent static and dynamic sealing.
- suitable for long travel.
- little tendency of "stick-slip".
- small break-away load after prolonged standstill.

application



category of profile

machined product only.

single acting

the K05-R seal is designed for use as a piston seal - either single or double acting where two seals are used 'back to back'

area of application: pneumatic

- reciprocating pistons in pneumatic cylinders.
- as piston seal in heavy machine construction with impact load.
- suitable for dry and conditioned air.
- can be used as a pivot seal for small loads.

note

the ratio between nominal width and sealing height cs/H should not drop below a value of 1/1.25 (essentially according to ISO 5597 housings for piston and rod seals).

function

K05-R profiles are lip seals designed to seal pressurised space against the atmosphere or in case of back to back arrangement with intermediate guide ring to seal between two pressurised spaces, mainly for reciprocating movements. the design is based on application in standard pneumatic systems (conditioned or dry air with initial lifetime lubrication). 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	hydrolysis	dry running	wear resistance
s-mart NBR	-30 °C ... +100 °C	1 m/s	25 bar (2,5 MPa)	-	-	O
s-mart FKM	-20 °C ... +200 °C	1 m/s	25 bar (2,5 MPa)	-	-	O
s-mart EPDM ¹	-50 °C ... +150 °C	1 m/s	25 bar (2,5 MPa)	++	-	O
s-mart HNBR	-25 °C ... +150 °C	1 m/s	25 bar (2,5 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 attention: not suitable for mineral oils!
- ++ ... particularly suitable
 - + ... suitable
 - o ... conditional 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.

gap dimension

referring to the low pressure range in standard pneumatic applications the extrusion gap depends only on cross section and temperature. the maximum value of the permissible extrusion gap is reached when the piston touches one side of the cylindrical tube or the guide. the extrusion gap should not exceed 10% of the cross section for an operating temperature of 70°C, influences due to thermal expansion and manufacturing tolerances have to be considered.

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

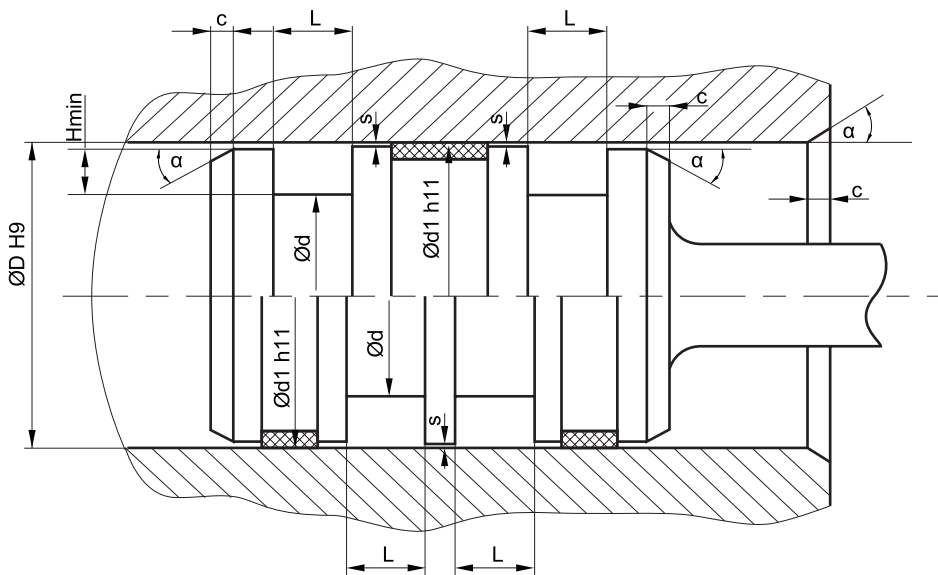
tolerance recommendation

seal housing tolerances	
∅d	h10
∅D	H9

mode of installation

for inside diameters of 25mm and more, the seal can generally be slipped over the piston and snapped into closed grooves. due to occurring deformation force at installation, assembly aid tools are to be used for large cross-sections. the material deformation should not exceed the value of 30%, otherwise the permanent deformation would be too large.

recommended mounting space:



plastic guiderings (wearbands) have to feature a adequate cutting gap (recommendation: 2-5% of D). if metallic guides are used, spiral grooves shall be provided. smaller values for Hmin will ease the installation (reduced elongation and mounting force) but the height of the retaining collar has to be sufficient to assure a stable fit in the housing (larger than cs/2, smaller retaining collars will increase the danger of eversion of the profile).



insertion chamfer:

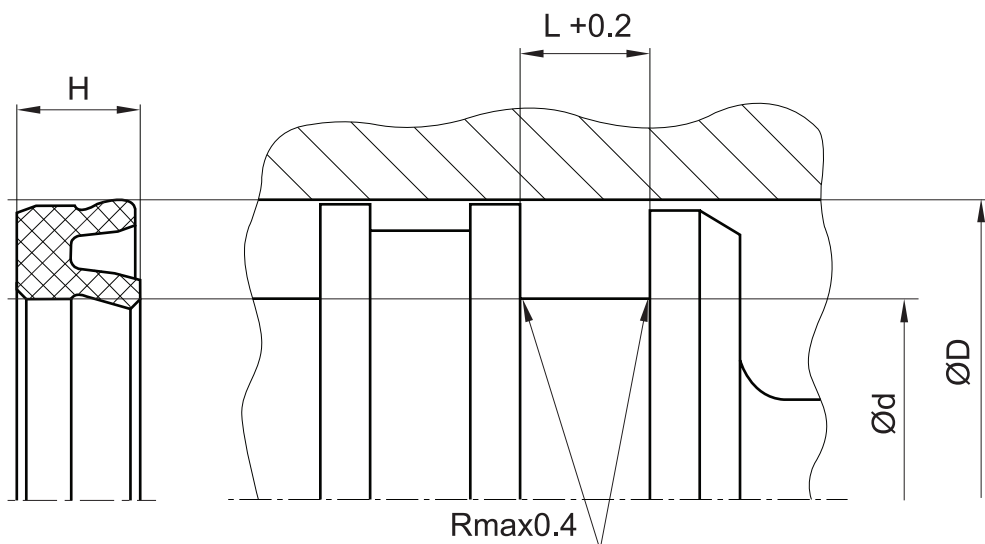
in order to avoid damage to the piston seal during installation, the piston and the housing is to be chamfered and rounded as shown in the “recommended mounting space” drawing. the size of chamfer depends on the seal type and profile width.

cs (mm)	c (mm)	
	$\alpha = 15^\circ \dots 20^\circ$	$\alpha = 20^\circ \dots 30^\circ$
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

instead of a chamfer, the piston can also be designed with a radius. recommended size of the radius is equal to size of chamfer (R=c).

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...

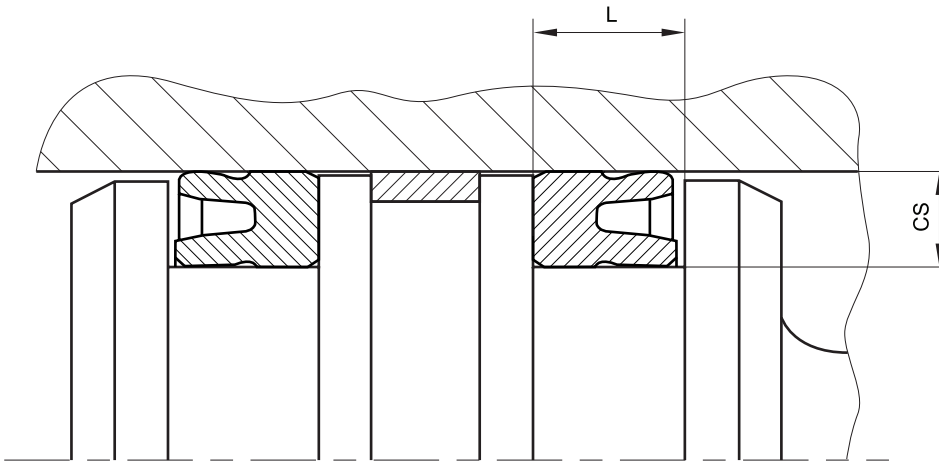


the ratio between nominal width and seal height cs/H should not drop below 1/1.25. therefore we recommend the following housing heights.

ØD [mm]	Ød [mm]	L [mm]	$cs = (\text{ØD} - \text{Ød})/2 \text{ [mm]}$
5 ~ 24,9	$\text{ØD} - 8$	6	4
25 ~ 49,9	$\text{ØD} - 10$	7	5
50 ~ 74,9	$\text{ØD} - 12$	8	6
75 ~ 149,9	$\text{ØD} - 16$	10	7,5
150 ~ 299,9	$\text{ØD} - 20$	12	10
300 ~ 500	$\text{ØD} - 24$	18	12,5
500 ~ 750	$\text{ØD} - 30$	20	15
> 750	$\text{ØD} - 40$	26	20



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.