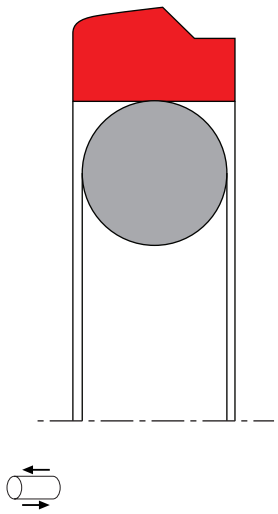
SEAL SPEC
K08-E



description

o-ring activated asymmetric PTFE piston seal, low friction. for extreme low or high speed.suitable for positioning functions. K08-E can be used where a sealing piston has pressure on one side, amongst others, in standard housings according to ISO 7425/1.

+ asymmetric double-acting composite piston seals, with a gliding part made of low-friction material and an elastic preload element.
+ interference fit on the inside diameter.
+ various materials are available for different purposes.
+ snaps into simple grooves (see notes on installation).
+ the free space on the trailing side reduces the risk of gap extrusion.
+ highest degree sealing across a wide temperature range.
+ for pressures up to 400 bar (in special cases up to 800 bar) as a seal between pressurised spaces and atmosphere..
+ good sealing in all pressure ranges.
+ good static and dynamic sealing.
+ suitable for short and long travel with extremely slow or quick movements.
+ no stick- slip. no drag pressure build-up.
+ small break-away load after prolonged periods of standstill.
+ exact positioning due to little friction.
+ high mechanical efficiency.
+ insensitive to thermal damage caused by air in the oil.

category of profile

machined or molded/standard/trade product

single acting

the K08-E 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; hydraulics

- reciprocating pistons on hydraulic cylinders, small swiveling motion permissible.
- as piston seal for small permissible frictional forces or if smooth running is required.
- for heavy-duty operating conditions, profile K08-ES is preferred.

note

- the calculation program is based on mounting spaces according to ISO 7425, part 1. intermediate sizes are possible, with an o-ring for standard sizes. for deviating dimensions, use K08-ES. attention must be given to a balanced ratio between sealing part and preload element.

function

K08-E profiles are composite piston 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.

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operating parameter & material

sealing element	material energizer	back-up ring	temperature	max surface speed	max pressure[1]	hydrolysis	dry running	wear resistance
PTFE glass	NBR	-	-30 °C ... +100 °C	10 m/s	400 bar (40 MPa)	-	++	+
PTFE bronze	NBR	-	-30 °C ... +100 °C	10 m/s	400 bar (40 MPa)	-	++	+
PTFE carbon	NBR	-	-30 °C ... +100 °C	10 m/s	400 bar (40 MPa)	-	++	+
PTFE glass	FKM	-	-20 °C ... +200 °C	10 m/s	400 bar (40 MPa)	-	++	+
PTFE bronze	FKM	-	-20 °C ... +200 °C	10 m/s	400 bar (40 MPa)	-	++	+
PTFE carbon	FKM	-	-20 °C ... +200 °C	10 m/s	400 bar (40 MPa)	-	++	+
PTFE glass	EPDM	-	-50 °C ... +150 °C	10 m/s	400 bar (40 MPa)	++	++	+
PTFE bronze	EPDM	-	-50 °C ... +150 °C	10 m/s	400 bar (40 MPa)	++	++	+
PTFE carbon	EPDM	-	-50 °C ... +150 °C	10 m/s	400 bar (40 MPa)	++	++	+
PTFE glass	MVQ	-	-60 °C ... +200 °C	10 m/s	400 bar (40 MPa)	++	++	+
PTFE bronze	MVQ	-	-60 °C ... +200 °C	10 m/s	400 bar (40 MPa)	++	++	+
PTFE carbon	MVQ	-	-60 °C ... +200 °C	10 m/s	400 bar (40 MPa)	++	++	+
UHMWPE	MVQ	-	-60 °C ... +80 °C	10 m/s	400 bar (40 MPa)	++	+	+
XPU	NBR	-	-30 °C ... +110 °C	5 m/s	600 bar (60 MPa)			

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

++ particularly suitable + suitable o conditional suitable - not suitable

[2] attention: not suitable for mineral oils!

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 decreased leackage rates elastomer materials (polyurethane or rubber) in other sealing systems are to be preferred.

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	3,75	5,5	7,75	10,5	12,25	14
	safe extrusion gap (mm)						
100 bar (10 MPa)	0,27	0,33	0,38	0,43	0,50	0,55	0,60
200 bar (20 MPa)	0,19	0,25	0,28	0,33	0,37	0,43	0,45
300 bar (30 MPa)	0,17	0,20	0,22	0,25	0,30	0,34	0,38
400 bar (40 MPa)	0,16	0,18	0,19	0,21	0,25	0,28	0,30

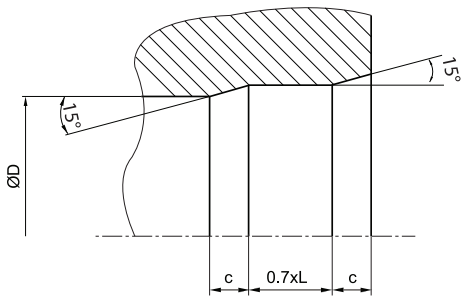
the above data are maximum value and can't be used at the same time. e.g. the maximum operating speed depend on material type, pressure, temperature and gap value. temperature range also dependent on medium.
the table refers to a operating temperature of 80 °C. temperatures below may increase the safe extrusion gap slightly, at temperatures above 80 °C, the gap dimensions has to be reduced or a stronger profile selected. for extrusion gap sizes resulting from tolerance pair H8/f8 pressure ranges above 400 bar can be reached in special cases, influences due to thermal expansion have to be considered. we recommend to contact our technical department.

mode of installation

in case of closed grooves, it is not recommended to slip the seal over the piston by hand (uneven material deformation in the sealing part). after the o-ring is placed into the groove, the sealing part should be stretched over a installation cone by using a sleeve (assembly aid tools).

a recovery of the sealing part with a calibrating sleeve is advisable, however, a special shaped insertion chamfer on the cylinder barrel can also be designed (danger of tilting).

values for "c" see insertion chamfer.



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	h10
ØD	H9

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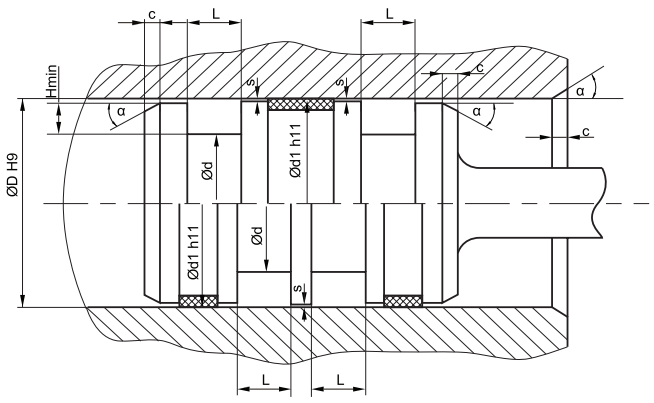
insertion chamfer

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)	
	α = 15° ... 20°	α = 20° ... 30°
2,45	2,5	1,5
3,75	3,5	2
5,5	4,5	3
7,75	5	3,5
10,5	6	5
12,25	8	6
14	10	7

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).

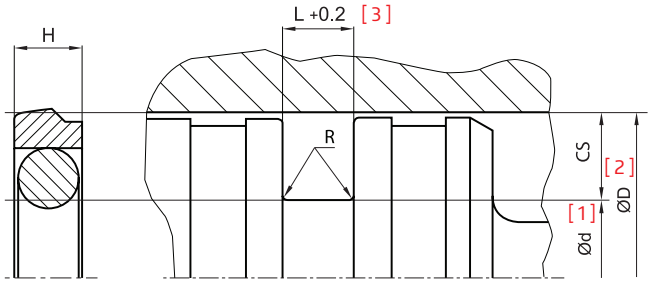
recommended mounting space



plastic guiderings (wearbands) have to feature a adequate cutting gap (recommendation: 2-5% of D). if metalic 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 in case of occuring drag pressure). in order to avoid drag pressure built up in case of back-to-back arrangement, the distance between the seals should be as small as possible.

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]	ØD [mm] [2]	L [mm] [3]	cs = (ØD - Ød)/2 [mm]
ØD - 4,9	8 ~ 14,9	2,2	2,45
ØD - 7,5	15 ~ 39,9	3,2	3,75
ØD - 11	40 ~ 79,9	4,2	5,5
ØD - 15,5	80 ~ 132,9	6,3	7,75
ØD - 21	133 ~ 329,9	8,1	10,5
ØD - 24,5	330 ~ 669,9	8,1	12,25
ØD - 28	670 ~ 1000	9,5	14
ØD - 28	> 1000	9,5	14

the ratio between nominal width and seal height should be in accordance to ISO 7425 part 1. we recommend the following values:

L	R
≤ 4,2	max. 0,5
> 4,2 .....≤ 6,3	max. 0,8
> 6,3 .....≤ 8,1	max. 1,2
> 8,1	max. 2

fitted