SEAL DATA SHEET

K03-F

3D Seals > Hydraulics & Pneumatics >
PISTON SEALS

Description

PTFE-Piston seal. O-Ring activated, asymmetrical PTFE piston seal, low friction and no stickslip effect. good adaptation possibilities for diverse temperatures and media by selection of suitable O-Ring material, almost no dead spots as required for applications in food and pharma industry

For symbols that are not bold, please consult our technical for application limitations.

- Asymmetric single acting piston compact seal, with the dynamic sealing lip beeing shorter than the static one. In addition, an O-ring inserted into the groove increases the
- Interference fit on the inside diameter.
- Various materials are available for different purposes
- Good sealing effect across a wide temperature range.
- Sealing effect enhanced by high recovery rate.
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- For pressures up to 200 bar as a seal between pressurised spaces.
- Good sealing in the all pressure range.
- Excellent static and dynamic sealing.
- Suitable for short & long travel.
- Small break-away load.
- No reverse leakage (i.e. minor relative motion of the sealing edges when the direction is changed).
- Little friction when dry running or when used in media with poor lubrication (conditionally suitable for use in aqueous media).

Single Acting

The K03-F 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 and swiveling pistons in cylinders, push rods, fittings in the chemical industry.

Note

- Considering the limited long-time rupture strength of the PTFE materials, the ratio of cs/H should not fall below a value of 1/1.5. Using back up rings can widen the application range.
- Varying the angle of the chamfer on the dynamic sealing lip allows adaptation to media (steeper angle for high viscosity media) respectively a pressure relief (flat angle).
- Cross-sections limited with 15 mm.

Function

K03-F profiles are compact seals designed to seal pressurised space against the atmosphere or - in case of back to back arrangement with intermediate guidering – to seal between two pressurised spaces, mainly for reciprocating movements. The design is based on application in aggressive media or with high thermal demands. 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
Seal	Energizer						
PTFE 1	FKM 75	-30 °C ... +200 °C	1 m/s	100 bar (10 Mpa)	-	++	0
PTFE 2	FKM 75	-30 °C ... +200 °C	1 m/s	160 bar (16Mpa)	-	++	+
PTFE 1	HNBR	-25 °C ... +150 °C	1 m/s	100 bar (10 Mpa)	+	++	0
PTFE 2	HNBR	-25 °C ... +150 °C	1 m/s	160 bar (16Mpa)	+	++	+
PTFE 1	MVQ 70	-60 °C ... +200 °C	1 m/s	100 bar (10 Mpa)	++	++	0
PTFE 2	MVQ 70	-60 °C ... +200 °C	1 m/s	160 bar (16Mpa)	++	++	+
PE	MVQ 70	-60 °C ... +80 °C	0.5 m/s	200 bar (20 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

1. 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, attention should be paid to restrictions for pressure range and wear resistance. For higher gliding speeds another system

Gap Dimension

Operating Pressure	cs = (ØD - Ød)/2 mm					
	4	5	7.5	10	12.5	15
	Safe Extrusion Gap (mm)					
50 bar (5 MPA)	0.30	0.35	0.55	0.67	0.67	0.67
100 bar (10 MPa)	0.22	0.25	0.40	0.50	0.50	0.50
150 bar (15 MPa)	0.20	0.23	0.35	0.45	0.45	0.45
200 bar (20 MPa)	0.17	0.20	0.33	0.40	0.40	0.40

Important Note

The above data are maximum value and can't be used at the same time. e.g. the maximum operating speed depends 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.

In exceptional cases, a pressure above the limit of 200 bar is possible, the safe extrusion gap is the result of the tolerance pair H8/f8, influences due to thermal expansion have to be considered. We also recommend contacting our Application Engineering department.

Surface Quality

Surface Roughness	R_{tmax} (µm)	R_a (µm)
Sliding	≤2.0	≤0.05-0.03
Bottom of Groove	≤10	≤1.6
Groove	≤10	≤1.6

Tolerance Recommendation

Seal Housing Tolerances	
Ød	h10
ØD	H9

Tolerance Recommendation

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°
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