



Hydraulic Seals



TRIDENT PRECISION INTERNATIONAL

151, SECTOR-06, IMT MANESAR, GURGAON, HARYANA

122050

 0124-4101151

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The F3 guiding tape made of PTFE compounds is specifically intended for use in hydraulic cylinders. The length of the cut-to-size guiding tape results in a suitable gap that allows the system pressure to pass toward the seal, taking thermal expansions into account. The resulting gap is preferably created at a 45 ° angle in order to enable a minimum guidance function under load in the direction of the gap. Alternative gap versions (straight cut, stepped cut) are possible.

The PTFE compound should be selected depending on temperature and the permissible permanent deformation ϵ .

- Vibration absorption effect.
- Very good emergency running properties in low-lube conditions.
- High load capacity (compressive strength), low wear and reduced friction due to special bronze additive in PTFE material.
- Also available as bulk material.
- Any desired nominal diameter available due to use of machining technique.
- Suitable for cylinder repairs.
- Ideally suited for large-diameters.
- Installation in closed and undercut housings.

Range of application

Operating temperature	-100 °C to +200 °C
Sliding speed	≤ 5 m/s

Compounds

Standard: Polon® 052, PTFE + 40 % bronze.

On request: Polon® 062, PTFE + 60 % bronze.

For cylinders made of alloys, light metal and high-grade steel, we recommend the use of compound Polon® 033 (PTFE + 25 % carbon).

Installation

The gap dimensions “e” guarantee an optimum service life of the guidance tapes. For the seals, however, the gaps “e” as mentioned on the respective catalogue pages are to be considered when it is essential to observe full operating conditions („Range of Application“) for the seals.

In case of special operating conditions (specific pressure loads, temperature, speed, use in water, HFA, HFB fluids etc.), please contact our consultancy service for a selection of the material and design best suiting your particular application requirements.



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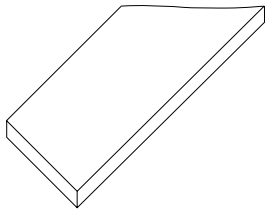
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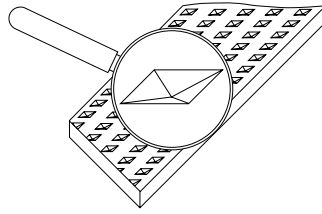
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Surfaces

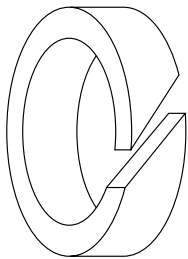


Guiding tape F3:
smooth (standard)

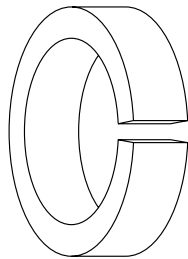


Guiding tape FW:
structured (on request)

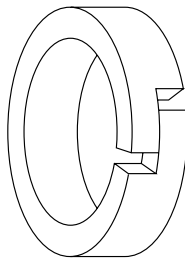
Cut types



Type A
(angle-cut)



Type S
(straight-cut)



Type Z
(step-cut)

Types A and S are used for bearings where it is imperative that the system pressure is carried on to the seals. They are designed as „open bearings“ with a well defined gap.

Type Z is a closed bearing, which in certain applications is used as a combined seal and bearing.



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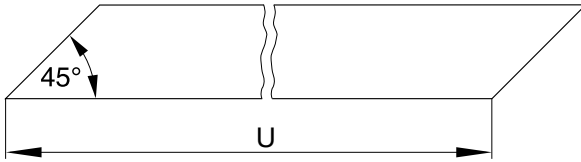
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Calculation of the stretched length „U“



The length „U“ of the tape is to be calculated from the mean circumferential length less the clearance at the joint „k“. The k-values stated in the table are based on a temperature rise of 120 °C. (S = thickness of the guiding tape.)

Calculation of the stretched length „U“

Cylinder Ø D Rod diameter d (mm)	Stretched length U		Tolerance (mm)	Gap k (mm)
	Piston	Rod		
≤ 45			± 0.25	1.8
> 45			± 0.4	3.5
> 80			± 0.6	4.4
> 100			± 0.8	5.6
> 125	$U = \pi \times (D - S) \cdot k$	$U = \pi \times (d + S) \cdot k$	± 1	6.6
> 150			± 1.2	8
> 180			± 1.4	9.5
> 215			± 1.6	12
> 270			± 1.8	15.5
> 330			± 2	19

Guiding elements



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Selection of the axial guiding width L

Choose the appropriate curve for the applicable guide tolerances. Note that the more precise the guidance, the lower the value for the selected ϵ .

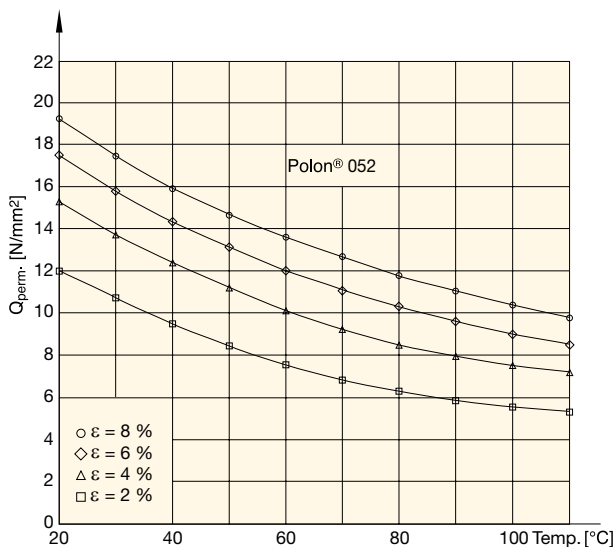
The following formula provides the minimum guidance width:

$$L \geq \frac{F}{Q (d_i - k \cdot \sqrt{2})}$$

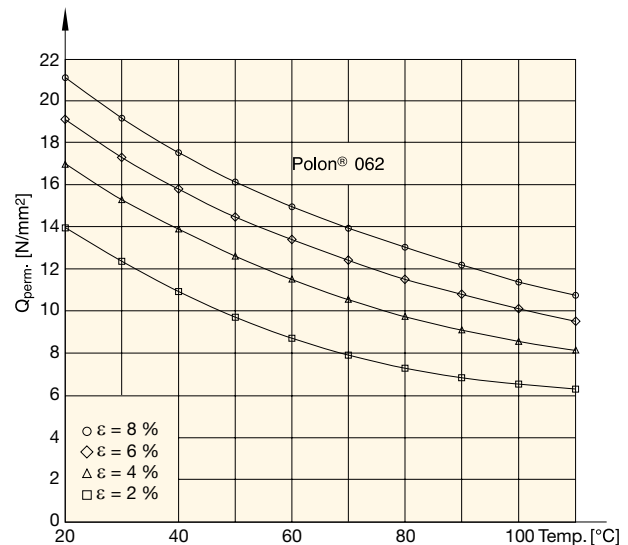
- d = inner diameter [mm]
- k = gap [mm]
- L = guidance width [mm]
- $Q_{perm.}$ = permissible specific load [N/mm^2]
- F = lateral force [N]

We recommend that the largest possible guidance length always be used even if the calculation yields a smaller value.

Permissible specific load $Q_{perm.}$ in relation to temperature t and the respective permanent set ϵ for the compounds Polon® 052:



Permissible specific load $Q_{perm.}$ in relation to temperature t and the respective permanent set ϵ for the compounds Polon® 062:



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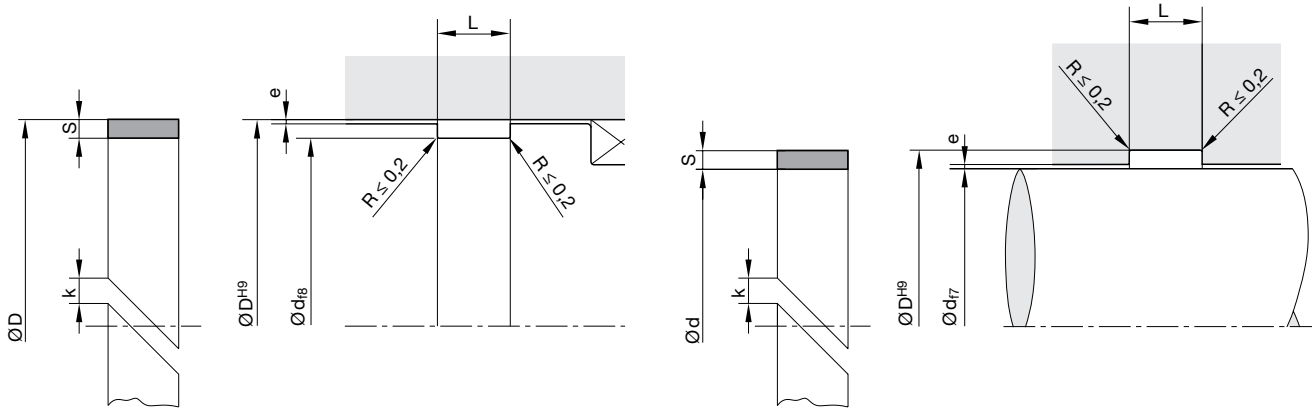
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For surface finish, lead in chamfer and other installation dimensions see „General installation guidelines“.

Housing dimensions

Series no.	Recommended rod Ø range	Guiding tape		Groove		
		d/D (mm)	S (mm)	L (mm)	d (mm)	D (mm)
15063	≤ 50	1.50 ^{+0.02} _{-0.03}	6.3 ^{+0.1}	D - 3.0	d + 3.0	0.25
15081	≤ 50	1.50 ^{+0.02} _{-0.03}	8.1 ^{+0.1}	D - 3.0	d + 3.0	0.25
15100	≤ 50	1.50 ^{+0.02} _{-0.03}	10.0 ^{+0.1}	D - 3.0	d + 3.0	0.25
15150	≤ 50	1.50 ^{+0.02} _{-0.03}	15.0 ^{+0.1}	D - 3.0	d + 3.0	0.25
16025	≤ 50	1.55 ^{+0.02} _{-0.03}	2.5 ^{+0.1}	D - 3.1	d + 3.1	0.25
16040	≤ 51	1.55 ^{+0.02} _{-0.03}	4.0 ^{+0.1}	D - 3.1	d + 3.1	0.25
20063	≤ 50	2.00 _{-0.05}	6.3 ^{+0.1}	D - 4.0	d + 4.0	0.30
20081	≤ 51	2.00 _{-0.05}	8.1 ^{+0.1}	D - 4.0	d + 4.0	0.30
20097	> 50	2.00 _{-0.05}	9.7 ^{+0.1}	D - 4.0	d + 4.0	0.30
20150	> 50	2.00 _{-0.05}	15.0 ^{+0.1}	D - 4.0	d + 4.0	0.30
20200	> 50	2.00 _{-0.05}	20.0 ^{+0.1}	D - 4.0	d + 4.0	0.30
25042	> 50	2.50 _{-0.05}	4.2 ^{+0.1}	D - 5.0	d + 5.0	0.40
25056	> 50	2.50 _{-0.05}	5.6 ^{+0.1}	D - 5.0	d + 5.0	0.40
25063	> 50	2.50 _{-0.05}	6.3 ^{+0.1}	D - 5.0	d + 5.0	0.40
25081	> 50	2.50 _{-0.05}	8.1 ^{+0.1}	D - 5.0	d + 5.0	0.40
25097	> 50	2.50 _{-0.05}	9.7 ^{+0.1}	D - 5.0	d + 5.0	0.40
25150	> 50	2.50 _{-0.05}	15.0 ^{+0.2}	D - 5.0	d + 5.0	0.40
25200	> 50	2.50 _{-0.05}	20.0 ^{+0.2}	D - 5.0	d + 5.0	0.40
25250	> 50	2.50 _{-0.05}	25.0 ^{+0.2}	D - 5.0	d + 5.0	0.40
25300	> 50	2.50 _{-0.05}	30.0 ^{+0.2}	D - 5.0	d + 5.0	0.40

Guiding elements



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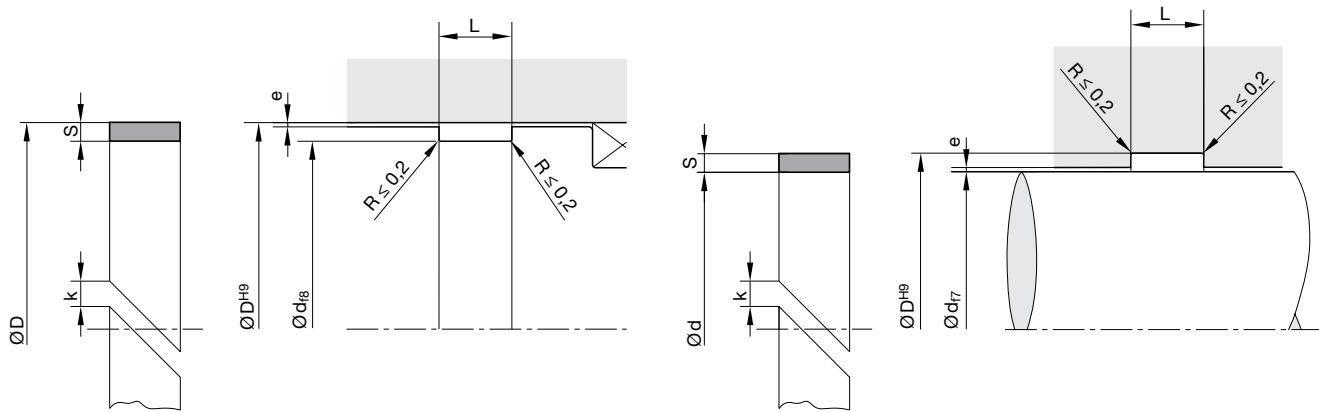
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Ordering example piston guidance

Mating surface	steel
Surface	smooth
Piston diameter	80 mm
Groove	9.7 × 2.5 mm

a) by the metre	F3 0000 052 25097 A (9.7 × 2.5)
b) cut to length	F3 0800 052 25097 A (9.7 × 2.5 × 239)
F3	Profile
0800	Piston diameter × 10 (by the metre: 0000)
052	Compound
25097	Series no.
A	Type of cut

Ordering example rod guidance

Surface	structured
Rod diameter	50 mm
Groove outer diameter	OD = ID + 2S
Groove	6.3 × 2.5 mm
FW 0550 052 25063 A	(6.3 × 2.5 × 161.5)



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