



Memory Packings

Memory packings are single-acting sealing elements with excellent sliding properties. They are used primarily for sealing reciprocating pistons and rods as well as for rotary and swiveling applications. The one-piece seal is manufactured from the high-strength fluoroplastic, PTFE or PE-UHMW, with its memory effect resulting from a special manufacturing technique. The memory effect allows the required contact pressure to be achieved without an additional spring element.



This means that preload can be kept very low, thus providing the memory packing with outstanding friction properties. In conjunction with the special PTFE compounds HS 21059 and HS 21029 developed for this product this translates into low wear of the sealing lip and thus long service life with low breakaway and displacement forces. Since the seal is installed with the open side facing toward the higher system pressure, the sealing effect increases with rising pressure.

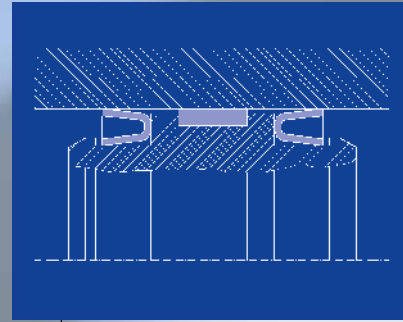
Memory packings are used in any application placing particularly high demands on the friction behavior of the seal.

Benefits

- Extremely low friction, constant across a wide temperature range
- Outstanding dry-running characteristics
- No stick-slip effects even at low sliding speeds
- Extremely low breakaway forces even after prolonged downtimes
- High chemical and thermal resistance
- No volumetric changes by swelling or shrinkage
- Compact design
- Very good cost/benefit ratio
- Suitable for sterilizing
- Easy to flush
- Dimensions from 3 mm to 140 mm available
- Special dimensions available on request

Fields of Application

Application Examples

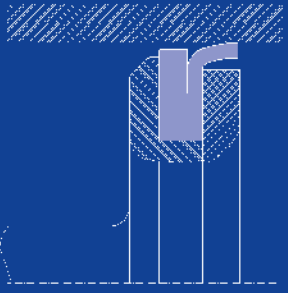


Pneumatics

Cylinder seal with low displacement force for stick-slip-free operation.

Memory packings are used in a wide range of industrial applications:

- Automotive industry, e.g. in headlight washer systems, small compressors for pneumatic suspensions, ride leveling systems, vibration dampers
- General manufacturing and mechanical engineering, e.g. valves and solenoid valves
- Pneumatics, e.g. in cylinders and other pneumatic components
- Compressors and vacuum pumps, e.g. oil-free compressors/applications
- Food processing industry, e.g. metering devices and packaging/filling equipment
- Medical and pharmaceutical industry, e.g. in dental technology piston compressors
- Tank system engineering, e.g. vacuum pumps for fuel vapor suction systems
- Painting technology, e.g. in paint valves



Compressors and Vacuum Pumps

Wobble piston compressor with cup seal serving as a piston seal in non-lubricated operation (oil-free application).

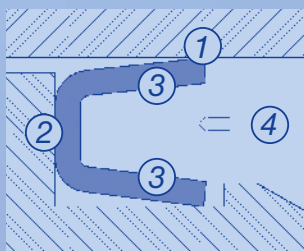
Food Processing Industry

Rod seal used in valves for bottling plants. With minimum clearance space and good flushing properties (aseptic applications).

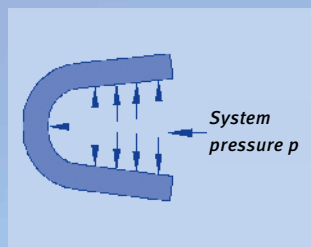
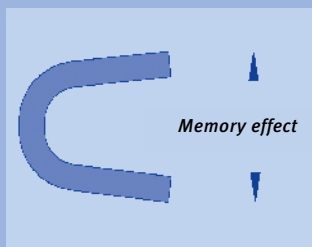
Painting Technology

Valve needle seal for paint valves in automotive painting lines.

Seal Design and Action Principle

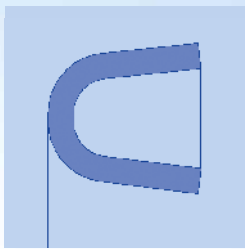


- ① Sharp sealing edge
- ② Back of seal
- ③ Flexible sealing lip
- ④ Pressure/media side



The action principle of all seal types and shapes is identical. The seals differ merely in terms of their geometries and applications. The sealing effect is achieved by the inherent preload of the plastic casing (memory effect of the compound). The radial contact pressures are sufficient to effectively seal a pressureless application. In the event of additional system pressure the contact pressure forces will rise along with the total sealing pressure.

Standard Type EMS



**EMS – Piston and Rod Seal;
and as Shaft Seal**

Operating Limits⁽¹⁾

T = -40 °C to +220 °C

p = up to 20 bar

v = 15 m/s ⇄

v = 1.0 m/s ↻

Stock Range, Standard Dimensions, Basic Type: EMS

Ordering example: EMS – 12 x 6 x 3.6 – HS 21029


EMS = Type

12 = Hole Ø

6 = Rod Ø

3.6 = Groove width

HS 21029 = Standard compound PTFE special compound HS 21029,
the advanced, second-generation compound is HS 21059.

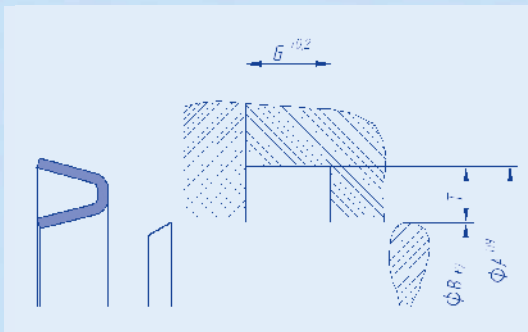
To find the compound combinations best suiting the
respective applications see compound table 
pages 60 – 62.

Hole Ø A ^{H9}	Rod Ø B _{f7}	Groove Depth T	Groove Width G ^{+0.2}	Part-No.
12	6	3	3,6	386.480
13	7	3	3,6	206.070
14	8	3	3,6	403.687
16	10	3	3,6	785.881
18	12	3	3,6	785.903
20	14	3	3,6	785.911
22	16	3	3,6	785.938
24	18	3	3,6	786.012
25	19	3	3,6	783.765
26	20	3	3,6	092.100
28	20	4	5,0	785.954
30	22	4	5,0	786.020
32	24	4	5,0	785.962
33	25	4	5,0	786.039
36	28	4	5,0	786.047
38	30	4	5,0	787.515
40	32	4	5,0	785.970
44	36	4	5,0	786.055
50	40	5	6,3	785.989
55	45	5	6,3	403.970
60	50	5	6,3	785.997
63	53	5	6,3	786.004
66	56	5	6,3	780.960
70	60	5	6,3	090.980
73	63	5	6,3	840.327
80	70	5	6,3	786.063
100	88	6	7,5	786.071

Special dimensions and other compounds available on request.

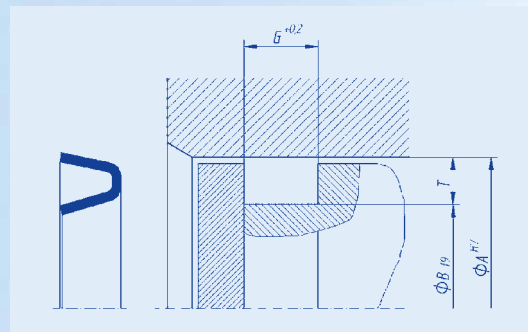
Installation Dimensions

Rod Seal



Rod ϕ B^{H9}	Groove Depth T	Groove Width $G^{+0.2}$
6 – 20	3	3,6
20 – 40	4	5,0
40 – 88	5	6,3
88 – 113	6	7,5

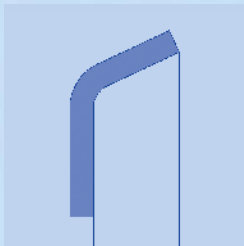
Piston Seal



Cylinder ϕ A^{H9}	Groove Depth T	Groove Width $G^{+0.2}$
12 – 28	3	3,6
28 – 50	4	5,0
50 – 100	5	6,3
100 – 125	6	7,5

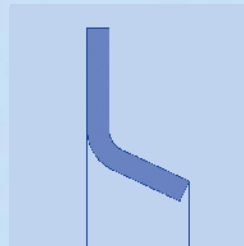


Standard Types EMT | EMTX | EMH | EMHX (without stock range)



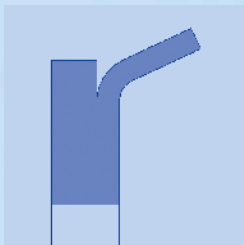
EMT – Piston Seal

Cup packing used as piston seal.



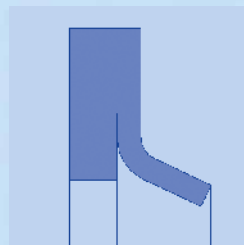
EMH – Rod Seal | Wiper | Shaft Seal

Cap packing used as rod seal/wiper as well as shaft seal.



EMTX – Piston Seal

Cup packing, with integrated guide, used as piston seal.



EMHX – Rod Seal | Wiper | Shaft Seal

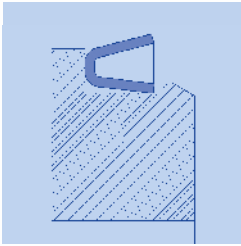
Cap packing with integrated guide.

Special Versions

For certain application requirements different versions of ready-/easy-to-assemble **complete solutions** are available as well.

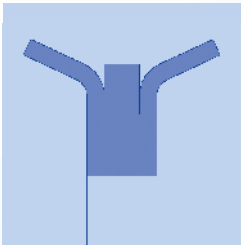
Benefits:

- One-piece piston
- Replaces metal piston by plastic piston
- Ready-/easy-to assemble versions offering favorable cost-benefit ratio
- No damage to seals during assembly/installation
- Complete package solutions, including seal and integrated guide, available



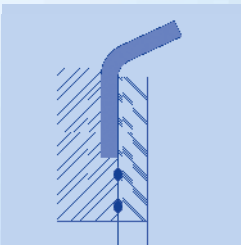
Complete Piston with Standard Memory Packing EMS

Single-acting; piston can be made from aluminum, plastic or steel.



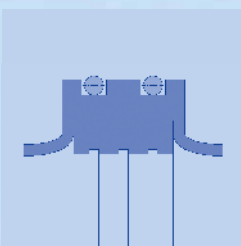
Complete Piston

Double-acting with guide.



Complete Piston with Memory Cup Packing in Plastic Piston – Ultra-Sonic-Welded

PA or POM plastic piston.



Sealing Bush as Rod and Guide Bush

Double-acting.

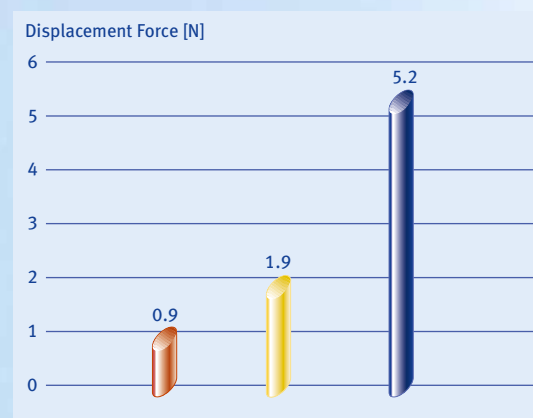
Technical Details

The memory effect is dependent on a number of different influencing factors, such as manufacturing parameters, tool/mold design, sealing compound, etc.

When it comes to designing a memory packing, you can trust us to draw on years of experience. All you need to do is to provide us with your technical operating conditions. To do so, simply complete our technical questionnaire at the end of the catalog.

Displacement Force ⁽²⁾

This diagram shows the low displacement force of a memory packing compared to spring-energized seals and a hydraulic seal, a so-called O-ring-pre-loaded PTFE stepped ring (SRI). The low displacement force results from the low preload of the memory packing. It offers extremely favorable friction behavior.



- *Memory packing type EMS*
- *Spring-energized seal type URI*
- *Stepped seal SRI with O-ring*

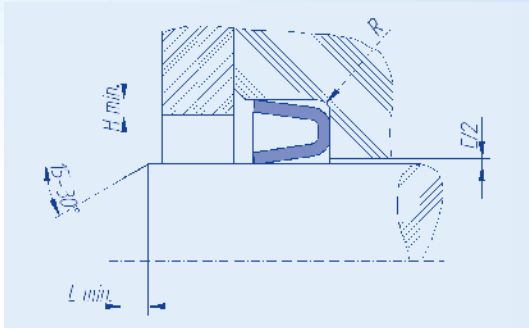
Test Conditions:

Hydraulic cylinder rod \varnothing 11 mm,
hard-chromium-plated, Rz 0.2 μ m,
 $v = 60$ mm/min, pressureless,
oil-lubricated, room temperature

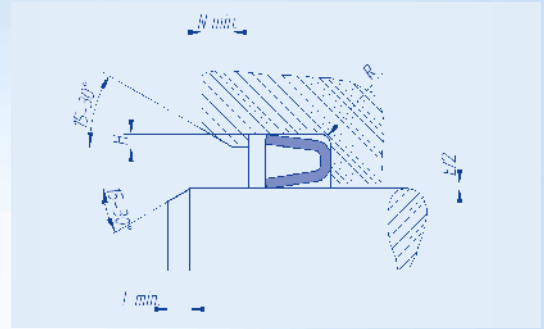


Design and Fitting Instructions (see Spring-Energized Seals chapter, page 30)

Rod Seal

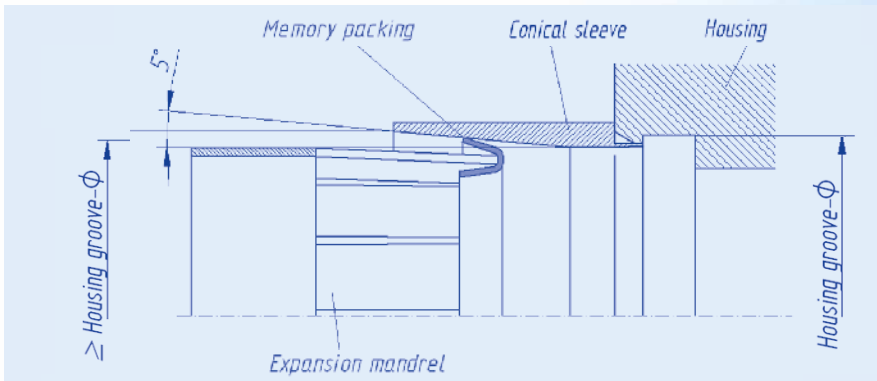


Assembly with split groove.



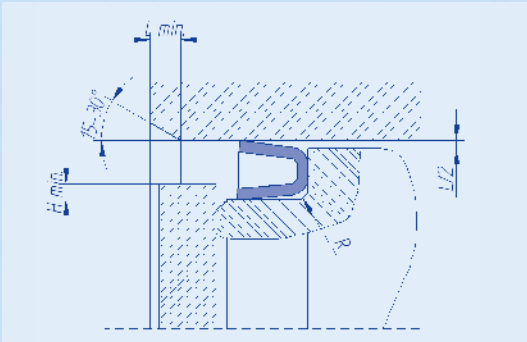
Assembly with semi-closed groove (snap-in assembly).

Snap-in assembly

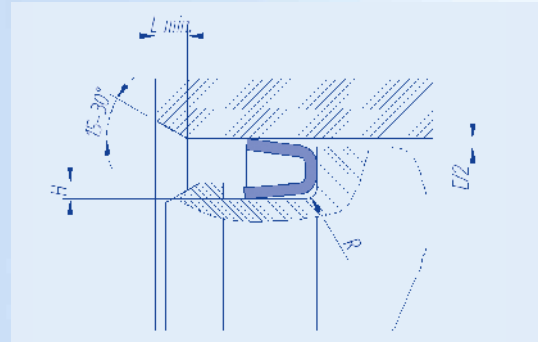


Nominal Cross-Section ⁽⁶⁾ T x G	Lead-in Chamfer L _{min} at		Retainer H or H _{min}	Fitting Taper N _{min} at		Radius R	Radial Clearance max E/2
	15° Phase	30° Phase		15° Phase	30° Phase		
3 x 3.6	4.8	2.3	0.4	3.7	1.7	0.25	0.05
4 x 5.0	4.8	2.3	0.5	4.5	2.1	0.25	0.07
5 x 6.3	4.8	2.3	0.6	4.5	2.1	0.30	0.08
6 x 7.5	4.8	2.3	0.7	5.2	2.4	0.30	0.10

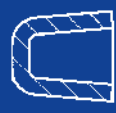
Piston Seal



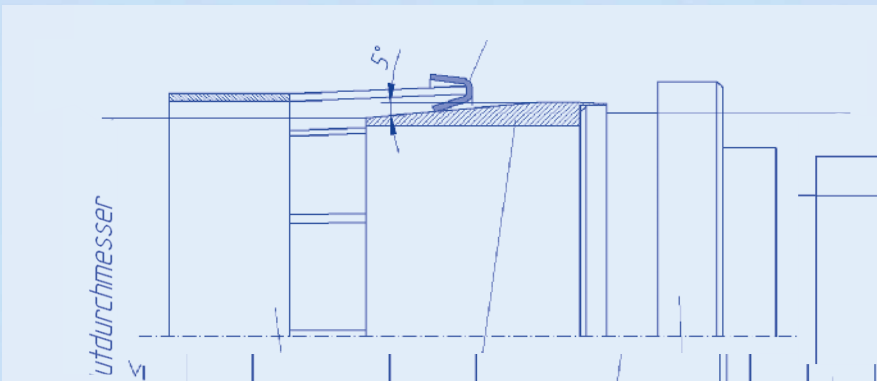
Assembly with split groove.



Assembly with semi-closed groove (snap-in assembly).



Snap-in assembly



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Surface Quality

See Spring-Energized Seals chapter.

Storage Instructions

See Spring-Energized Seals chapter.

Take our plastics know-how to the test.

Headquarters and further plants

ElringKlinger Kunststofftechnik GmbH | Etzelstraße 10 | D-74321 Bietigheim-Bissingen
Fon +49 7142 583-0 | Fax +49 7142 583-200 | sales.ekt@elringklinger.com | www.elringklinger-kunststoff.de

Heidenheim Plant | Badenbergstraße 15 | D-89520 Heidenheim
Fon +49 7321 9641-0 | Fax +49 7321 9641-24 | sales.ekt@elringklinger.com | www.elringklinger-kunststoff.de

Mönchengladbach Plant | Hocksteiner Weg 40 | D-41189 Mönchengladbach
Fon +49 2166 9590-0 | Fax +49 2166 9590-55 | sales.ektp@elringklinger.com | www.elringklinger-kunststoff.de

ElringKlinger Engineered Plastics (Qingdao) Co., Ltd. | Room 408-409, Building C, Qingdao Int. Finance Plaza
222 Shenzhen Rd, Laoshan District | 266061 Qingdao V.R. China | Fon +86 532 6872 2830 | Fax +86 532 6872 2838
info.ektc@elringklinger.com | www.elringklinger-ep.cn

ElringKlinger Engineered Plastics North America, Inc. | 4971 Golden Parkway | Buford, GA 30518 USA
Fon +1 678 730 8190 | Fax +1 770 932 2385 | info.ektu@elringklinger.com | www.elringklinger-ep.com

www.elringklinger-kunststoff.de



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