

#### **Benefits**

- No stick-slip even with low sliding speeds and even after prolonged downtimes
- Low wear
- Good dry-running properties
- Simple design of installation grooves
- Low friction
- Ø 3 mm to Ø 3000 mm available
- High pressure stability
- Small installation spaces
- Lubrication depot
- For internally and externally sealing functions

**T**ype MRA and MRI are **double-acting** composite seals. They are primarily used with alternating directions of pressure (e.g. piston seals).

**T**ype SRI and SRA are **single-acting** composite seals. They have proven to be particularly effective for sealing piston rods. The sealing effect is produced by the inherent preload of the PTFE profile ring vis-à-vis the rod and the preload of the rubber-elastic O-ring in the groove area.

With rising system pressure the radial contact pressures increase as well.

**R**otary composite seals are particularly well suited for sealing rotating shafts, such as in rotary transmissions, rotary distributors, rotary joints and swiveling motors in mobile hydraulics and machine tools. A specially designed slide ring based on PTFE or PE is pressed against the surface by an elastomer O-ring and additionally activated by the system pressure.

# Composite Seals

## Fields of Application

Composite seals are particularly well suited for sealing pistons and rods in hydraulic and pneumatic working cylinders.

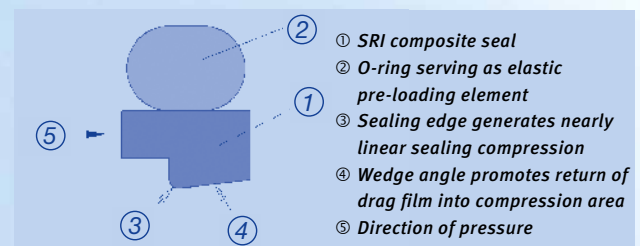
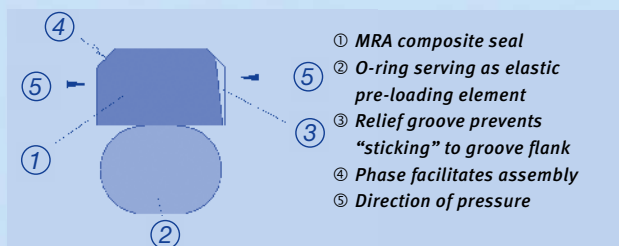
## Versions and Operating Limits<sup>(1)</sup>

Sliding speed	max. 4 m/s ↔
Temperature range	-45 °C bis +200 °C
Service pressure	max. 400 bar

## They consist of two components:

- a profile ring made of the high-strength fluoro-plastic, PTFE, or alternatively from an ultra-high-molecular PE for dynamic sealing of the sliding surface (primary seal)
- an O-ring for static sealing in the groove area (secondary seal)

## Design and Action Principle



## Fitting Instructions

- Use lead-in chamfers/fitting tapers for cylinder barrel and piston rod
- Debur and chamfer sharp edges
- Cover crests of thread
- Carefully remove dust, dirt, swarf, chips, etc.
- Do not use sharp-edged fitting tools

## Surface Quality

	Dynamic contact surface/rod	Static groove diameter/housing
Rz	≤ 1.0 µm	≤ 6.3 µm
Rmax	≤ 2.0 µm	≤ 12.5 µm

## To facilitate assembly we recommend:

Greasing and/or oiling of sliding surfaces and seals (do not use lubricants with solid additives). Heating of externally sealing PTFE rings in oil or hot water up to 80 °C to 120 °C.

## Compounds

On request, depending on application.

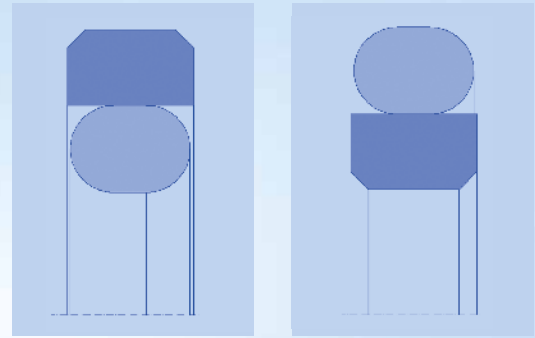


# Type MRA | MRI

## Groove Dimensions

\*Depending on installation conditions, other profiles – differing from the standard dimensions provided – may be selected for **composite seal type MRA** (externally sealing) and **type MRI** (internally sealing). The respective groove dimensions are listed in the table below.

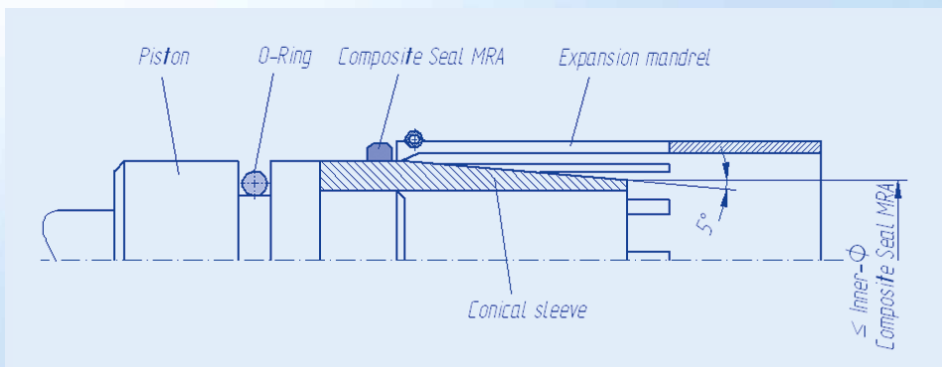
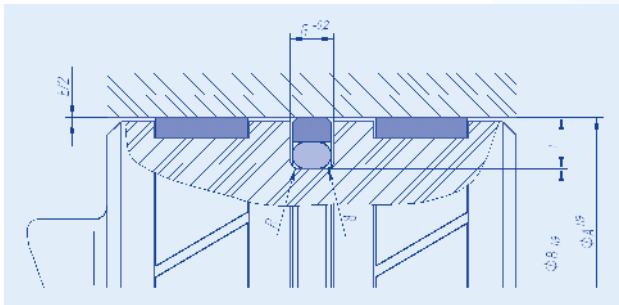
Profile Designation*	Groove Depth T	Groove Width G <sup>+0.2</sup>	Radius R max	Radial Clearance max E/2
8 – 15	2.45	2.2	0.4	0.15
15 – 40	3.75	3.2	0.6	0.15
40 – 80	5.50	4.2	1.0	0.20
80 – 133	7.75	6.3	1.3	0.20
133 – 330	10.50	8.1	1.8	0.25
330 – 670	12.25	8.1	1.8	0.25
670 – 1000	14.00	9.5	2.5	0.30
≥ 1000	19.00	13.80	3.0	0.40



## Fitting Instructions

- Insert O-ring into groove
- Slide composite seals onto fitting shell using expander
- Let composite seal snap into groove
- If necessary, we recommend subsequent calibration using a sleeve
- To assist with making the fitting tools, we will be happy to provide respective drawings

## Installation Example MRA



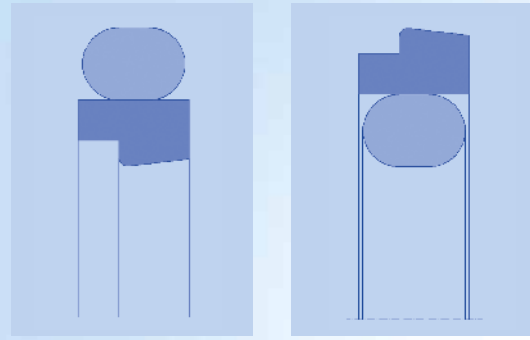
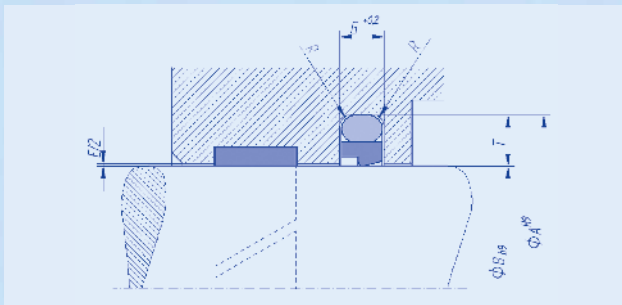
# Type SRI | SRA

## Groove Dimensions

\*Depending on installation conditions, other profiles – differing from the standard dimensions provided – may be selected for **composite seal type SRI** (internally sealing) and **type SRA** (externally sealing). The respective groove dimensions are listed in the table below.

Profile Designation*	Groove Depth T	Groove Width G <sup>+0.2</sup>	Radius R max	Radial Clearance max E/2
3 – 8	2.45	2.2	0.4	0.15
8 – 19	3.65	3.2	0.6	0.15
19 – 38	5.35	4.2	1.0	0.20
38 – 200	7.55	6.3	1.3	0.20
200 – 256	10.25	8.1	1.8	0.25
256 – 650	12.00	8.1	1.8	0.25
650 – 1000	13.65	9.5	2.5	0.30
≥ 1000	19.00	13.80	3.0	0.40

## Installation Example, Rod Seal SRI

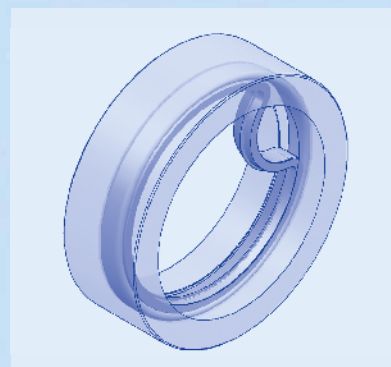
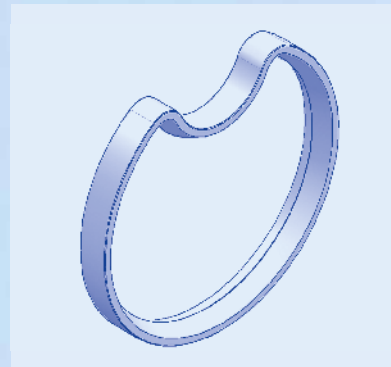


## Fitting Instructions

For rod diameters below 30 mm use axially accessible grooves.

For rod diameters above 30 mm the seals may be installed in the closed grooves.

- Inset O-ring into groove
- Compress composite seal into a “kidney” shape and insert into groove
- If necessary, we recommend subsequent calibration, using a mandrel

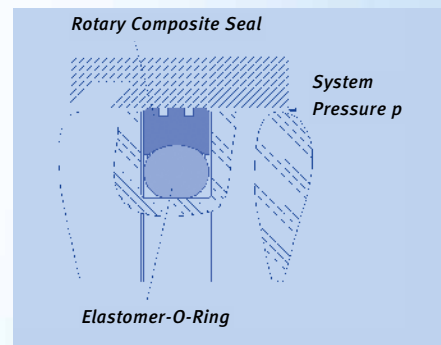
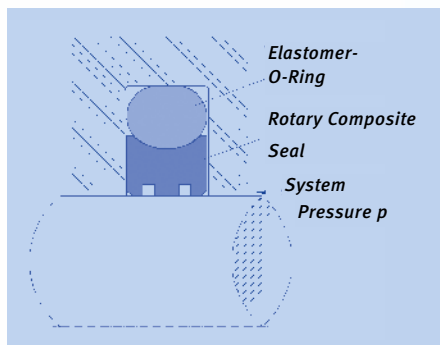


# Type MRR

## Groove Dimensions

\*Depending on installation conditions, other profiles – differing from the standard dimensions provided – may be selected for **Rotary composite seal type MRR** (internally and externally sealing). The respective groove dimensions are listed in the table below.

## Design and Action Principle



## MRR internally sealing

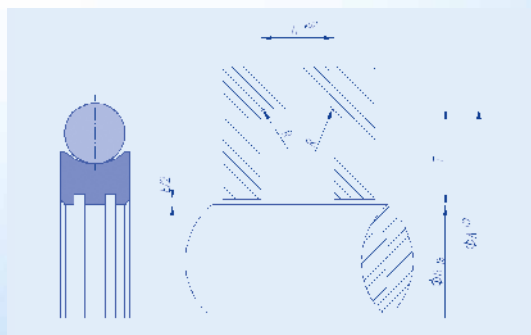
Profile Designation*	Groove Depth T	Groove Width G <sup>+0.2</sup>	Radius R max	Radial Clearance max E/2
6 – 19	2.45	2.2	0.4	0.15
19 – 38	3.75	3.2	0.6	0.15
38 – 200	5.50	4.2	1.0	0.20
200 – 256	7.75	6.3	1.3	0.20
256 – 650	10.50	8.1	1.8	0.25
650 – 1000	14.00	9.5	1.8	0.25

## MRR externally sealing

Profile Designation*	Groove Depth T	Groove Width G <sup>+0.2</sup>	Radius R max	Radial Clearance max E/2
8 – 40	2.45	2.2	0.4	0.15
40 – 80	3.75	3.2	0.6	0.15
80 – 133	5.50	4.2	1.0	0.20
133 – 330	7.75	6.3	1.3	0.20
330 – 670	10.50	8.1	1.8	0.25
670 – 1000	14.00	9.5	1.8	0.25

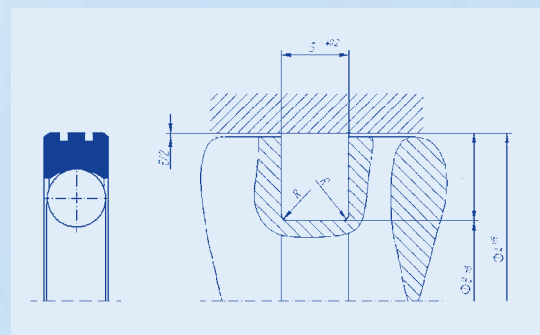
## Groove Dimensions

### Shaft seal internally sealing



## Groove Dimensions

### Shaft seal externally sealing



## Operating Limits<sup>(1)</sup>

Rotation speed	max 2.5 m/s $\odot$
Temperature range	-45 °C to +200 °C
Service pressure	max 300 bar

### **Fitting Instructions**

See table, page 54 and 55.

### **Surface Quality**

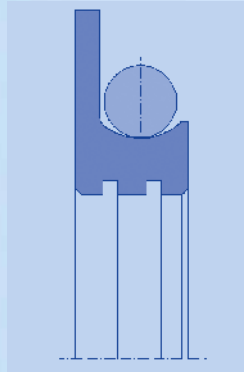
	<b>Contact surface, dynamic</b>	<b>Groove base diameter, static</b>
Rz	≤ 1,6 μm	≤ 6,3 μm
Rmax	≤ 2,0 μm	≤ 12,5 μm
Ra	≤ 0,2 μm	≤ 0,4 μm
Hardness	≤ 58 HRC	–

### **Compounds**

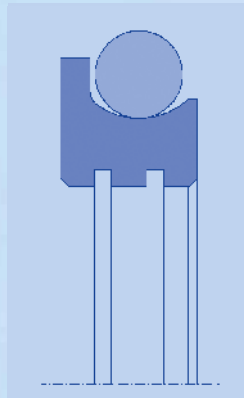
On request, depending on application.

### **Special Versions**

With clamp-in flange



With compression support



# 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](mailto:sales.ekt@elringklinger.com) | [www.elringklinger-kunststoff.de](http://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](mailto:sales.ekt@elringklinger.com) | [www.elringklinger-kunststoff.de](http://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](mailto:sales.ektp@elringklinger.com) | [www.elringklinger-kunststoff.de](http://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](mailto:info.ektc@elringklinger.com) | [www.elringklinger-ep.cn](http://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](mailto:info.ektu@elringklinger.com) | [www.elringklinger-ep.com](http://www.elringklinger-ep.com)

[www.elringklinger-kunststoff.de](http://www.elringklinger-kunststoff.de)



The information provided in this brochure, based upon many years' experience and knowledge, does not claim completeness. No liability is assumed for damage claims on the basis of this information. All parts must be installed by trained and specialized staff. Product range and technical specifications subject to modification. No liability assumed for errata.