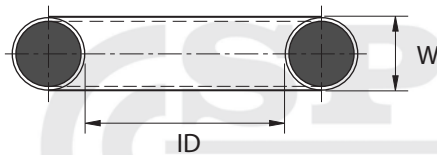


## FEP-Encapsulated O-Ring

### Description

The FEP-Encapsulated O-Rings are made of fluorocarbon rubber o-rings or silicone rubber o-rings with FEP-encapsulation, which covers the o-rings completely without seams. They are available in many standards and the dimensions are specified as inside diameter (ID) and the cross section (W). They can be fitted comfortably in existing o-ring grooves.



| Cross section W* | Thickness of the FEP-encapsulation |
|------------------|------------------------------------|
| 1.78 mm          | 0.20 mm                            |
| 2.62 mm          | 0.30 mm                            |
| 3.53 mm          | 0.38 mm                            |
| 5.33 mm          | 0.50 mm                            |
| 7.00 mm          | 0.50 mm                            |

\* Cross section W in accordance AS 568 and DIN 3771

O-Rings with FEP-encapsulation are available in accordance with various standards.

#### cross sections

|                          |                     |  |
|--------------------------|---------------------|--|
| <b>American standard</b> | AS 568 A (DIN 3771) | 1.78 - 2.62 - 3.53 - 5.33 - 7.00 mm                    |
| <b>British standard</b>  | BS 1806             | 1.78 - 2.62 - 3.53 - 5.33 - 7.00 mm                    |
| <b>Metric dimensions</b> |                     | 2.0 - 2.5 - 3.0 - 3.5 - 4.0 - 5.0 - 6.0 - 7.0 - 8.0 mm |
| <b>Swedish standard</b>  | SMS 1586            | 2.4 - 3.0 - 5.7 - 8.4 mm                               |

### Mode of action

FEP-Encapsulated O-Rings are double-acting sealing elements. As the pressure rises, the compression of the seal is increased.

### Advantages over conventional O-Rings

- No stick slip and low friction
- Compatible with most chemicals and fluids, very good chemical resistance
- Cause no contamination when used with foodstuffs, pharmaceutical and medical products
- Can be sterilized with physiologically harmless
- Temperature range between -60°C to +200°C, depending on the O-Ring compound
- Allow only low steam to spread through

## Operating ranges

Primarily used as static seals, e.g. for lids, covers, flanges and discs, etc. However, the FEP-encapsulated O-Rings can also be used for dynamic seals, e.g. for pistons, rods, spindles, etc. In case of insignificant strains and stresses.

## Fields of application

Mainly used in the chemical industry, petrochemicals, medical, the foodstuffs industry, water and wastewater technology and similar industries. Typically used in the valve spindles and in mechanical seals.

## Materials

Fluoride ethylene propylene (FEP) has very good chemical resistance properties, similar to those of PTFE (polytetrafluoroethylene). The elastomer, fluorocarbon rubber (fluorocautchouc - FPM) also has very good chemical and thermal strength properties. Silicone caoutchouc (VMQ) has outstanding resistance to aging and a wide operating temperature range.

## Operating Temperature ranges

|     |   |                       |
|-----|---|-----------------------|
| FEP | : | appr. -60°C to +204°C |
| FPM | : | appr. -25°C to +200°C |
| VMQ | : | appr. -60°C to +200°C |

## Advices on installation and construction

The FEP-encapsulated O-Rings cannot be squeezed into place as easily as the conventional o-rings. A split groove is recommended for radial static and dynamic installation to avoid unnecessary distortion of the rings. When the rings are used in external application, e.g. pistons, they must be stretched out and then put back in shape. The stretching should be carried out on top of a tapered tool, and a calibration collar is used for reshaping. The rings should be first heated in oil water to approximately 100°C before the installation to speed up the process.

The rings should be installed in rectangular grooves. For operating pressures higher than appr. 50 bar, it is recommended to fit concave back-up rings to prevent the o-rings from being extruded through the sealing gap.

Important Note: never force the ring into the groove, e.g. by buckling it.

## Surface roughness

The function of the seal and its service life depends on the quality and character of the surface.

### Radial-dynamic and static Bore/Rod

Groove surface static

$$R_a = 0.05 - 0.6 \mu\text{m} (R_{\text{max.}} = 0.2 - 2.5 \mu\text{m})$$

Groove surface dynamic

$$R_a \leq 2.5 \mu\text{m} (R_{\text{max.}} \leq 10 \mu\text{m})$$

with pulsating pressures

$$R_a \leq 1.5 \mu\text{m} (R_{\text{max.}} \leq 6 \mu\text{m})$$

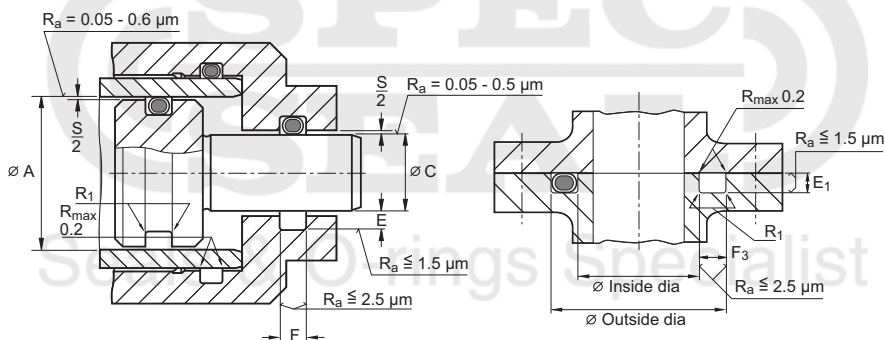
### Axial-static

Seal and Groove surfaces

$$R_a \leq 2.5 \mu\text{m} (R_{\text{max.}} \leq 10 \mu\text{m})$$

with pulsating pressures

$$R_a \leq 1.5 \mu\text{m} (R_{\text{max.}} \leq 6 \mu\text{m})$$



| Part-No.** | Cross Section W | Radial - dynamic/static |                      | Axial - static        |                       | Radius R1 | Diametrical clearance Smax. |
|------------|-----------------|-------------------------|----------------------|-----------------------|-----------------------|-----------|-----------------------------|
|            |                 | Groove dept E + 0.05    | Groove width F + 0.2 | Groove dept E1 + 0.05 | Groove width F3 + 0.2 |           |                             |
| 014-050    | 1.78            | 1.45                    | 2.2                  | 1.2                   | 2.2                   | 0.4       | 0.15                        |
| 112-178    | 2.62            | 2.25                    | 3.1                  | 1.9                   | 3.1                   | 0.6       | 0.20                        |
| 214-284    | 3.53            | 3.10                    | 4.2                  | 2.7                   | 4.2                   | 1.0       | 0.20                        |
| 329-395    | 5.33            | 4.70                    | 6.2                  | 4.3                   | 6.2                   | 1.2       | 0.25                        |
| 429-475    | 7.00            | 6.10                    | 8.2                  | 5.8                   | 8.2                   | 1.5       | 0.35                        |

\* The groove width can be greater than 20%, if a greater swelling (more than 10%) is to be expected.

O-Ring compound : Fluorocarbon rubber (FPM) = V  
Silicone rubber (VMQ) = S