O-rings and Static Sealing Profiles
We are an active international group of independent seal manufacturers and plastics processors. In our group, we produce all types of gaskets and plastic parts such as O-rings, moulded rubber parts, metal rubber compounds, foam moulded parts, semi-finished products and machines for machining seals. The latest production techniques are used.

The most commonly used sealing element is the O-ring. Trygonal offers a wide range of O-rings and static seals. Each O-ring size is available in metric or inch dimensions, and custom sizes are possible. The smallest size starts at a cord thickness and internal diameters of less than 1 mm. The largest O-rings are manufactured in cross sections of 30 mm or larger and up to a diameter larger than 3 m.

Materials
We have a wide range of materials, both for standard and specialty applications. A selection of our materials are EPDM, FKM, NBR, HNBR, CR, MVQ, PVMO, TFE, FRK. For special applications, we also manufacture O-rings made out of UHMWPE, PTFE, PEEK, polyurethane, FEP-coated or metallic materials.

Static sealing profiles
- Dairy Fittings
- Square profiles
- Roof edge profiles
- Double roof edge profiles
- Back-up rings

Surface treatment
O-rings can be specially surface treated. For example: Labs-free, halogenated, greased with mo-lykote, talc, PTFE-coated or cured.

Delivery standards
All O-rings are available in accordance with DIN 3771, ISO 3601, AS 568 B, BS 1806, BS 4518 and other standards.

Approvals
BAM, BfR, with DGW W 270, FDA, MIL, KTW, NSF, UL, USP, WRAS, 3-A Sanitary Standards

Applications
Automotive, construction, mining, railways, power generation, aerospace, semiconductor, power plant, solar and wind power, food & beverage, engineering, medical, mobile hydraulics, oil & gas, paper, pharmaceutical, steel works

Trygonal
O-rings and Static Sealing Profiles
Standard O-rings

Determination and rough sizing of your O-ring

The O-rings are defined by the inner diameter d1 and the cross section d2 = \(2\sqrt{d1\times d2}\).

In case of an outer sealing application the dimension d1 of the O-ring has to be chosen approximately 1–5% smaller. The O-ring will stretch slightly.

In case of an inner sealing application the dimension d1 of the O-ring has to be chosen approximately 1–3% larger. The O-ring therefore will have tight fit on insertion into the gap.

O-ring dimensions / International standards

All O-rings are available in accordance with standards such as DIN 3771, ISO 3601, AS 568 B, BS 1806, JISB 2401, LJF R, MIL. We stock more than 10,000 O-ring tools, such as DIN 3771, ISO 3601, AS 568 B, BS 1806, JISB 2401, LJF R, MIL. We stock more than 10,000 O-ring tools.

O-ring special dimensions

Depending on customers demands and applications we can also produce O-rings upon request in specific materials, colours and dimensions or sizes.

O-ring surface coating

To improve the installation, as well as automatic mounting, optical appearance, friction and cleanliness we coat and cure the O-rings.

- Labs-free O-rings are the leaders in lacquer damaging substances. Therefore the rings will be treated in our plasma surface treatment machine.
- Talcum coating: an installation aid
- Molycote coating: an installation aid
- Graphite coating: an installation aid
- Silicone coating: an installation aid
- Co-coating: to reduce slip stick and break the torque in dynamic O-ring applications
- PTFE coating, friction reduction, coloring
- O-ring alternatives, Static Sealing Elements

O-ring alternatives, Static Sealing Elements

Functional problems occur due to the O-ring’s application. For example:

- Mounting, twisted ring
- Pressure, extrusion, compression set
- Dynamic, twisted ring
- Dynamic, leakage

Specially developed sealing solutions for these applications:

- Backup-rings, axial-radial seal in combination with O-rings, against extrusion
- Rectangular rings, static, axial, radial sealing
- X-rings, radial and dynamic sealing element
- Roof edge profiles, static, axial and radial as well as high pressure applications
- FEP encapsulated O-rings, resistant to most chemical liquids
- Metal rings; for axial sealing applications and high pressures.

Fields of applications

- Flanges
- Pistons
- Rods
- Trapezoidal grooves
- Triangular grooves

Depending on the pressure and on the gap additional backup rings can be used.

O-ring applications

- Specially developed sealing solutions for these applications
- Metal rings; for axial sealing applications and high pressures.
- Backup-rings, axial-radial seal in combination with O-rings, against extrusion
- Rectangular rings, static, axial, radial sealing
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FEP O-rings

FEP O-rings are rings of two compounds: the outside sheath is the chemical-resistant material FEP. The inside core is made out of an elastic material such as silicone or vitone. These materials are responsible for the necessary restoring force. The FEP O-rings can be used from -60°C to +200°C and guarantee a low compression set with lower cold flow abilities compared to PTFE O-rings.

PTFE O-rings

The PTFE O-ring is only suitable for specific applications such as flange seals in chemical plants. The PTFE O-ring is the first choice for aggressive media.

Metal- and C-rings

Metal- and C-rings are used at high temperatures up to 980°C and high pressures up to 6800 bar.

Turned rings

For specific dimensions, or should the application require a special material, we can also turn O-rings. Advantage of this production process: There are no mould costs necessary and the ring can be manufactured in a very short time.

Vulcanized Cord rings

If the mechanical requirements allow this manufacturing process a cord can be cured to an O-ring. Almost any size can be quickly created with this process.

X-rings

The X-ring is an alternative to the O-ring.

Backup rings / Support rings

The Backup ring prevents the migration of the O-ring into the sealing gap.

TS35 / TK35 / TR35

If there a dynamic O-ring application planned we can offer a better technical alternative such as the TS35. This ring will not twist and can therefore be used for a long period.
We manufacture O-rings in different ways and we use different crosslinking methods.

**Production methods**

- **Compression moulding:** Within the compression process, a raw rubber cord is inserted into a mould. The mould consists of two mould halves and will be closed under pressure and temperature. This method is used for smaller to medium series.
- **Injection moulding:** After the injection cooling period, the raw material is automatically injected into the mould. This procedure is used for medium to larger production runs.
- **Thermoplastic elastomers:** Different conditions (Reference DIN 7716 / DIN 9088).

**Storage conditions**

The shelf life of different O-ring materials depends on various conditions (Reference DIN 7716 / DIN 9088).

<table>
<thead>
<tr>
<th>Materials</th>
<th>Maximum lifetime</th>
</tr>
</thead>
<tbody>
<tr>
<td>NR, BR, SBR, ACN, IR, CR, CM, EPDM, VMQ, FVMQ, FKM</td>
<td>10 years</td>
</tr>
<tr>
<td>ACM, NBR, NBR, ACM, CR, CM</td>
<td>5 years</td>
</tr>
</tbody>
</table>

**Approvals / Conformity**

The materials and sealing elements we use must conform to all legal requirements. Special material compounds have been designed to meet all these standards. Ask us, we can help.