O-RINGS FOR THE PROCESS INDUSTRY

As a universal sealing element, the O-ring is a sealing component used in all industrial sectors. It is characterized by its excellent price-performance ratio and broad range of applications.

O-rings can be manufactured in nearly all conventional elastomer materials as a standard part in large quantities or in smaller quantities for customer-specific applications. In comparison to other sealing systems, the required installation space is extremely small, allowing material-saving designs. Though simple in form, O-rings can nonetheless be reliably used in a variety of installation configurations: as static seals in axial or radial direction, or for dynamic applications involving translatory and/or rotary movements.

Function

- Static sealing for axial and radial applications
- Dynamic sealing for applications with translatory and rotary movements

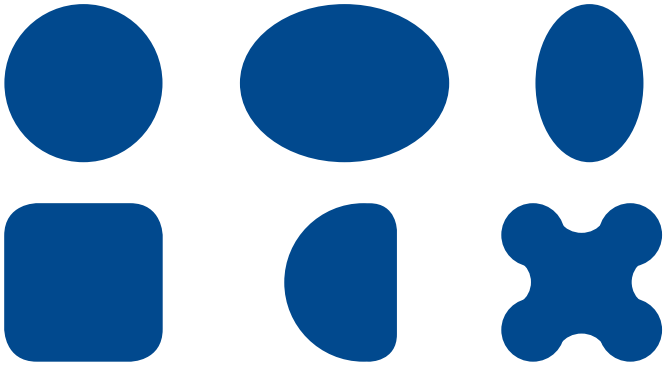
Dimensions

- Available in inch (US standard) and metric dimensions
- Numerous intermediate sizes are also available thanks to our extensive inventory of tools
- Special sizes of over 500 mm generally require new tools
- Standardized cross-section diameters from 1 mm to 6.99 mm, smaller and larger dimensions available on request

Types

- Compression- or injection-molded standard models
- Special designs and large dimensions of endless extruded cord, spliced or vulcanized
- In addition to round cross-sections, oval, rectangular, semicircular or x-shaped cross-sections are possible
- Special, customer-specific types can be created with new molding tools
- Surface-treated special designs such as non-stick and lubricated applications, painting, coating, nano-technological modification for the optimization of function and application
- PTFE-casing (with separating joint) or complete FEP encapsulation for use in highly corrosive media

Possible cross-sections



Applications

O-rings are utilized in numerous applications and in nearly all industries. An overview of the primary applications is given below.

- Static cover seals, axial sealing
- Static piston or rod seals, radial sealing
- Dynamic seals involving translatory movement (hydraulic or pneumatic)
- Dynamic seals involving rotation
- Valve seals
- Flange seals

Installation and assembly

- Edges should be rounded with at least r = 0.1 mm
- If O-rings must be stretched over sharp corners or threaded parts due to the design of the application, these surfaces should be covered with bushings/casings where possible
- In radial sealing applications, there should be lead-in chamfers on the pistons/rods (on the housing)
- When installing in pistons, avoid twisting. If necessary, use a compatible lubricant for easier assembly
- For applications in the food and beverage industry, the use of coated O-rings is recommended (e.g. PTFE lacquer, RFN treatment)
- When O-rings are installed in housings, the O-ring is compressed. Here it must be ensured that the O-ring does not warp (form a loop)

VALUES FOR THE CUSTOMER

- Can be used universally
- Available in all dimensions
- Available in all types of elastomer
- Easy to install and assemble
- Good price-performance ratio
- Small installation space

Design notes

	Design
General	The design of O-ring sealing systems (groove, sealing surface) is described in the relevant standards (e.g. DIN 3771 and 3601-1)
Compression	Compression in % of the cross-section diameter: • Static seals: 15 to 30 % • Dynamic seals - hydraulic at least 6 % • Dynamic seals - pneumatic: 2 to 6 %
Degree of groove fill	• O-ring volume 70 - 90 % of the groove volume • Note that the elastomer is more susceptible to thermal expansion than the metal housing • Applications in the food and beverage industry must be leak-free. The degree of groove fill can be more than 100 %
Elongation	• Max. 6 % in constant use • Max. 25 % of the elongation at break cited in the data sheet when assembled • In case of greater elongations: recovery time
Compression strain	Max. 3 % after installation, otherwise risk of deformation and shearing during installation
Gap widths and surfaces	• Acceptable gap widths and surface qualities depend on the material's hardness rating and the parameters. Standard values can be found in standards (e.g. DIN 3771 and DIN ISO 3601-1) • In dynamic application involving plastic housings, the friction heat can result in localized overheating • In dynamic applications or those involving pulsating pressures, no plastics reinforced with glass fibers should be used since otherwise extensive wear will occur