

## O-Rings



O-Rings offer the designer an efficient and economical sealing element for a wide range of static or dynamic applications. Inexpensive production methods and its ease of use have made the O-Ring the most widely used seal.

A wide choice of elastomer materials for both standard and special applications allow the O-Ring to be used to seal practically all liquid and gaseous media.

O-Rings are vulcanised in moulds and are characterised by their circular form with annular cross section. The dimensions of the O-Ring are defined by the inside diameter ID and the cross section CS.

### ADVANTAGES OF THE O-RING:

- Simple, one piece groove design reduces hardware and design costs
- Compact design allows smaller hardware
- Easy, foolproof installation reduces risk
- Applicable to a wide range of sealing problems, static, dynamic, single or double acting
- Wide compound choice for compatibility with most fluids
- Ex stock availability of many sizes for easy maintenance and repair

### APPLICATIONS:

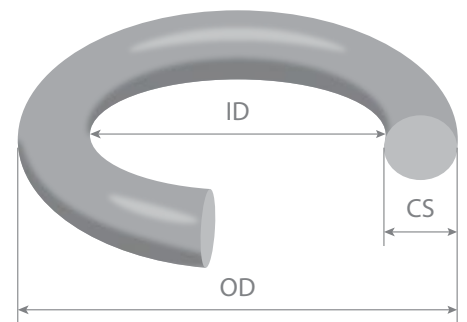
O-Rings are used as sealing elements or as energising elements for hydraulic slipper seals and wipers and thus cover a large number of fields of application. There are no fields of industry where the O-Ring is not used. From an individual seal for repairs or maintenance to a quality assured application in aerospace, automotive or general engineering.

The O-Ring is used predominantly for static sealing applications:

- As a radial static seal, e.g. for bushings, covers, pipes, cylinders
- As an axial static seal, e.g. for flanges, plates, caps

O-Rings in dynamic applications are recommended only for moderate service conditions. They are limited by the speed and the pressure against which they are to seal:

- For low duty sealing of reciprocating pistons, rods, plungers, etc.
- For sealing of slowly pivoting, rotating or spiral movements on shafts, spindles, rotary transmission leadthroughs, etc.



Abbey Seals stock thousands of metric and imperial sized O-Rings ranging from materials such as NBR, EPDM, FKM, Polyurethane, Silicone, PTFE, FDA approved and compliant materials, PERLAST®, ISOLAST®, KALREZ® & SIMRIZ®.

**Abbey Seals can supply any bespoke variations of high quality O-Ring seals, and can typically have next day delivery within Ireland, a service that has become the norm for urgent replacement parts such as O-Rings.**



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### PERFLUOROELASTOMER O-RINGS

Abbey Seals supply a range of high performance perfluoroelastomer materials (FFKM) such as PERLAST®, ISOLAST®, KALREZ® & SIMRIZ®. These specialised compounds offer excellent resistance to chemical attacks and are used in industries such as semi-conductor, pharmaceutical, chemical processing, food & beverage, aerospace, automotive, petroleum refining and medical devices.

Perfluoroelastomers are practically a rubber form of PTFE and are the most chemically resistant materials on the market today. The temperature parameters range from -40°C to 327°C



### X-RINGS

Another name for X Rings can be Quad-Rings or Nu-Lips, and they are used in many variations for strong static or dynamic sealing applications. X Rings differ from O-Rings where they have 2 sealing areas per side whereas the O-Rings just have one. This is down to the unique 4-lobe configuration, and therefore require less compression to maintain a solid seal. It also stops the seal twisting in its groove, so reduces friction and increases the life of seal.

The X Rings are also referred as standard size O-Rings, having the same dimensions as the AS568A O-Rings, and are available in various materials.

### FEP/PFA ENCAPSULATED O-RINGS

Encapsulated O-Rings have an elastomer core which is encapsulated in a jacket of Teflon® fluoropolymer. Typically these are manufactured with Viton® or Silicone and the cores are FEP or PFA jackets.

Encapsulated O-Rings are widely used in the food & beverages industry, pharmaceutical and chemical processing, where hygiene and chemical resistance is needed. As standard O-Rings have poor chemical resistance and solid PTFE O-Rings don't have the elasticity for long-term sealing, the choice is the encapsulated O-Ring.

#### Profiles:



FULL CORE  
Standard



HOLLOW CORE  
On request



SQUARE CROSS-SECTION  
On request



RECTANGLE CROSS-SECTION  
On request

### MATERIAL

**FEP Jacket:** FEP is the abbreviation for tetrafluoroethylene – hexafluoropylene. This material is similar to PTFE although has better mouldability making it possible to produce thin jackets for FEP seals.

**Elastomer Core:** The thermoplastic FEP jacket is a semi-rigid material. The elastomer core restores the elasticity of the seal. There are two different elastomer cores to choose from:

- FKM, -20 Degrees to 200 Degrees
- MVQ (Silicone), -60 Degrees to +200 Degrees

#### Materials Available:

- Viton®
- Nitrile
- Silicone
- FDA grade EPDM
- HNBR
- EPDM
- Neoprene®
- Viton® Extreme
- USP Class VI EPDM
- Aflas®

### SCARF CUT & VULCANISED O-RINGS

Scarf cut and vulcanised O-Rings are an excellent alternative when standard O-Rings cannot be used. Scarf cut and joined O-Rings are made from extruded O-Ring cord, then vulcanised to form an O-Ring size (ID) required. This process to join the ring has strict quality control procedures to ensure the join is at least 90% of the strength of the O-Ring cord.

Abbey Seals supplies a variety of sizes from 1.78mm – 25.4mm. Some limitations apply from a size perspective when smaller IDs are required and these can be checked from the spec sheet.



**We also offer an in-house manufacturing service for o-rings. Our CNC lathe produces o-rings in sizes from 5mm OD to 600mm OD. There is a wide range of materials available including PTFE, PU, NBR, EPDM, FPM, POM among others. We are happy to work with customers developing prototypes or producing non-standard sizes.**

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### BACK UP RINGS

Back Up Rings which can also be classed as anti-extrusion rings, are used in high pressure applications in conjunction with O-Rings.

Most common materials are Polyester, Polyurethane, Nylon, Acetal, PTFE, NBR and VITON®

Profiles available are Solid, Split, Contoured and spiral.

Care must be taken when selecting as the extrusion gap, O-Ring shore hardness and back up ring material dictate the pressure limits.

#### Back Up Rings Advantages:

- O-Ring life-time increased
- They are economic, low sealing cost and allows larger groove machining tolerances
- They have a better pressure resistance than O-Rings. (Recommended for applications with pressure higher than 50 bars)
- Abbey Seals has a large stock of contoured rings in Nitrile and Viton and we can supply which ever type you require.

### O-RING CORD

Extruded Cord, otherwise known as O Ring Cord ranges in cross section sizes from 1mm to 35mm.

A wide variety of materials are available NBR, VITON®, Silicone, Silicone Sponge, EPDM, EPDM Sponge, Neoprene Sponge, Polyurethane, PTFE, Metal detectable and Perfluoroelastomer food grade compounds.

#### Profiles:



**Abbey Seals stock a large range of cords to suit most sizes and can supply and deliver in 24 hours in most cases within Ireland.**

### O-RING SELECTION KITS

Abbey Seals stock a large variety of O-Ring Selection Kits to assist you with repair and replacement parts as you require them. From our Maxi kits, with hundreds of O-Rings in various sizes, to Flange maintenance kits – there will be sufficient O-Rings and Back Up Rings to suit.

#### Standard Packs Available

- Maxi Agricultural Kit
- Air Conditioning Kit
- Box G (Imperial) & Box H (Metric) Kits
- Carrytec Kit
- Flange Maintenance Kit
- Maxi Kits
- Maxi Plant Kit
- ORFS Kits
- QRC Kit
- Steam Cleaner Kit
- Maxi Combi Kit
- Maxi Imperial CBU Kit

### O-RING CORD SPLICING KIT

Abbey Seals also supply an O-Ring Cord Splicing Kit consisting of 14 different cross sections in 2 metre lengths of nitrile cord, knife, cutting block glue and measuring tape to help make individual O-Ring sizes.

**Enquire with Abbey Seals to find the O-Ring Kit you need.**

**You tell us the ID, Cross Section and material, and we will do the rest.**