



■ Description

Wills Rings® are metal seals which can be of two fundamental designs:

- a) Wills Rings®O
- b) Wills Rings®C

Wills Rings® are superior controlled compression type seals and are for static applications only. Wills Rings® have a degree of elastic recovery after being compressed in a housing - but this is not sufficient to guarantee sealing again once the housing has been dismantled.

Wills Rings® are designed for extreme conditions which exceed the capabilities of elastomer and polymer seals.

Wills Rings®O are the original Metal O-Ring seals

Wills Rings®O consist of a tube formed into a circular profile. Wills Rings®C are similar, but they have an open 'C' cross section. The open slot of the Wills Rings®C faces toward the system pressure and allows the seal to be pressure activated.

Wills Rings® are constructed from high quality metal tubing or strip in standard or thin wall thickness, they are often coated or plated with a softer material to increase their sealing performance. There are five types of Wills Rings® depending upon the application.

Advantages

- Temperature range from cryogenic to 850 °C
- Pressure range from ultra high vacuum to 1,000 MPa
- Compatible with a large range of media
- Corrosion resistant and radiation tolerant
- Simple and reliable sealing
- No "out gassing"
- Wide range of sizes

Applications

- Nuclear power plants
- Furnaces
- Offshore and marine
- Cryogenics
- Extreme vacuum systems
- Fire safe valves
- Plastic processing
- Exhaust and cylinder head seals

The design of Wills Rings® can be modified to suit the specific requirements of a system. These different designs offer a variety of sealing performances.

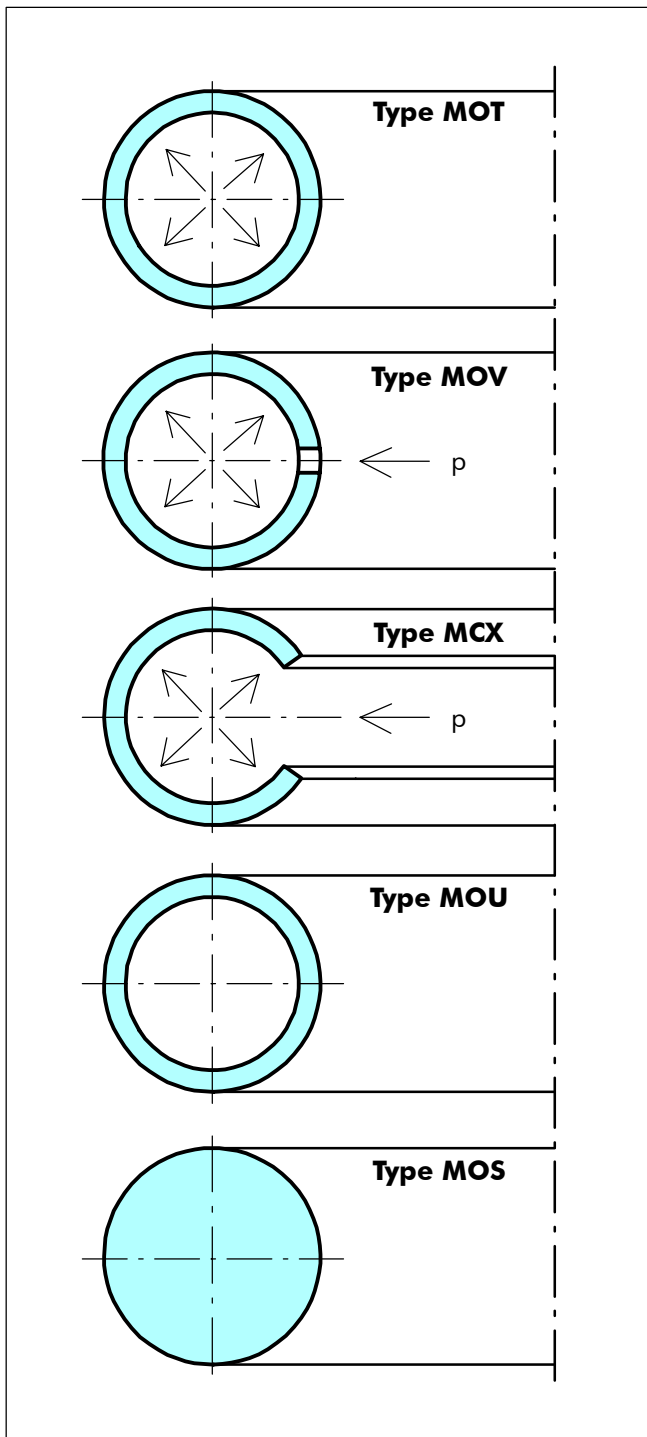


Figure 42 Wills Rings®

Method of operation

Wills Rings® consist of a metal ring, often coated, which is used as a deformable seal in a static sealing situation. The ring is located between two flanges and undergoes a controlled compression. Wills Rings® are defined by their free height which is the cross section in the axial direction of the seal. The free height d_2 of the seal is compressed down to the groove depth h . The resistance of the ring to compression enables it to form an effective seal when compressed. The resilient effect of the seal is increased by pressurising the internal volume of the ring (see type MOT gas filled Wills Rings®O).

Alternatively, if the system to be sealed is of very high pressure - this can be used to provide additional sealing effect. This is termed 'system actuation'. This is achieved by allowing the high pressure to enter the seal through either vent holes (see Type MOV), or through the open C slot (see type MCX).

Wills Rings® seals have a certain degree of elasticity. This is known as "springback". The springback is the elastic part of the seal deflection when it is installed in a groove. This influences the seal's ability to absorb or compensate for hardware variations due to temperature loadings, and thus maintain the seal integrity.

A softer plating/coating material can be applied to Wills Rings® to maximise sealing performance in difficult applications. The soft coating material yields during the ring compression and fills any surface machining marks.