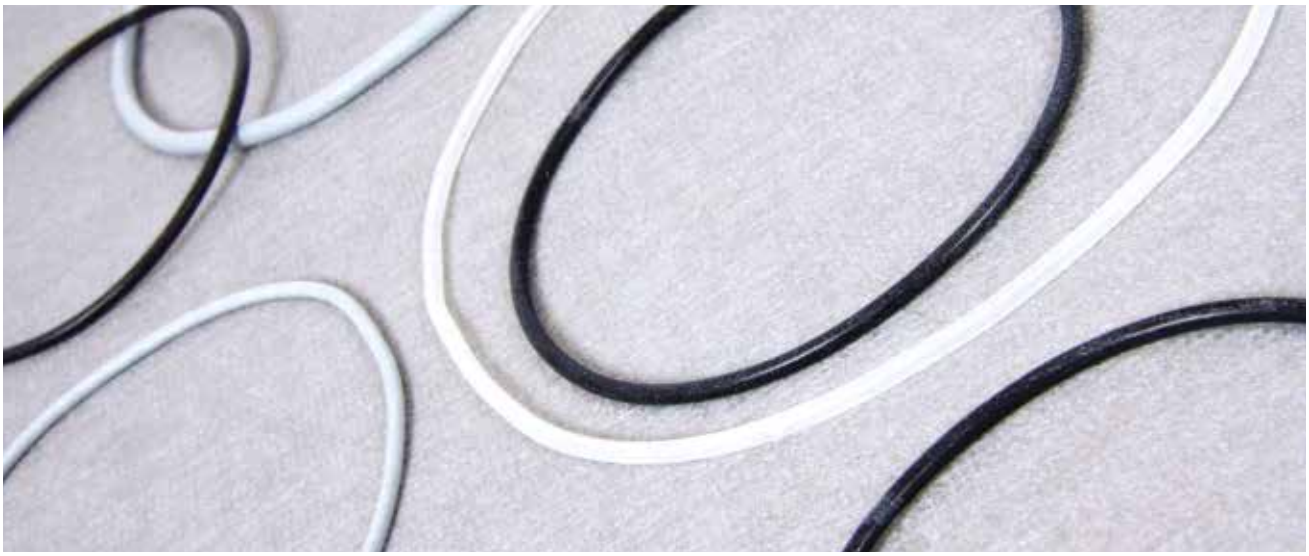
Environmental Sealing
Silicone O-Rings



Product Overview

Kemtron's experience in the manufacture of Silicone O-Rings is extensive, our preferred method of production is extruded and vulcanised. We have a large selection of vulcanising tools to suit our standard extrusions. The jointing process uses the same polymer compound ensuring gasket integrity is maintained across the joints. Moulded versions are available if specifically requested.

Both silicone & fluorosilicone are available for the manufacture of O-Rings in solid cord, tube and sponge. Please note that fluorosilicone is not available in sponge.

Advantages Of Vulcanised O-Rings

- Cost effective.
- No tooling costs.
- Reduced lead times.
- Better surface finish (zero flash).
- Allows hollow sections and sponge to be used for lower compression force.
- Custom sizes are easily produced with restriction on developed length.
- Tight tolerances on developed length and cross section.
- Vulcanised O-Rings with a ID as small as 10mm depending on cord diameter.

Design Considerations

- When selecting a profile it is important to give attention to the mechanical design of your product. Round and D section seals should ideally be mounted in a suitably sized groove.
- If the gasket is to fit in a groove. It is important that the gasket size chosen does not overfill the channel, when using solid sections you should ensure that the groove cross sectional area is a minimum of 5% greater than the proposed gasket cross section.
- Attention must also be paid to the closing force required to compress the gasket to the working height required.

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Tolerances

Solid silicone cord and tube cross section

- Up to 2mm ± 0.15mm
- 2mm to 5mm ± 0.25mm
- 5mm to 9mm ± 0.50mm

Silicone sponge cord cross section

- Up to 3mm ± 0.25mm
- 3mm to 5mm ± 0.50mm
- 6mm to 9mm ± 0.80mm

Developed Length

- ± 1.5mm = less than ± 0.5mm on diameter

Cross Section	Min inside Diameter of O-Ring
1mm	10mm
1.2mm	10mm
1.3mm	10mm
1.4mm	10mm
1.5mm	10mm
1.6mm	10mm
1.8mm	11mm
2mm	12mm
2.2mm	12mm
2.4mm	12mm
2.5mm	12mm
2.6mm	12mm
2.8mm	16mm
3mm	16mm
3.2	16mm
3.5mm	19mm
3.8mm	22mm
4mm	22mm
4.3mm	25mm
4.5mm	25mm
4.8mm	28mm
5mm	30mm

Gasket Groove Sizes

	15% Compression		20% Compression	
Cord Diameter	Depth	Width	Depth	Width
1mm	0.85mm	1.10mm	0.80mm	1.15mm
1.5mm	1.28mm	1.65mm	1.20mm	1.73mm
1.6mm	1.36mm	1.76mm	1.28mm	1.84mm
1.8mm	1.53mm	1.98mm	1.44mm	2.07mm
2mm	1.70mm	2.20mm	1.60mm	2.30mm
2.4mm	2.04mm	2.64mm	1.92mm	2.76mm
2.5mm	2.13mm	2.75mm	2mm	2.88mm
3mm	2.55mm	3.30mm	2.40mm	3.45mm
3.2mm	2.72mm	3.52mm	2.56mm	3.68mm
3.5mm	2.98mm	3.85mm	2.80mm	4.03mm
3.8mm	3.23mm	4.18mm	3.04mm	4.37mm
4mm	3.40mm	4.40mm	3.20mm	4.60mm
4.5mm	3.83mm	4.95mm	3.60mm	5.18mm
4.8mm	4.08mm	5.28mm	3.84mm	5.52mm
5mm	4.25mm	5.50mm	4mm	5.75mm
5.5mm	4.68mm	6.05mm	4.40mm	6.33mm
6mm	5.10mm	6.60mm	4.80mm	6.90mm
6.3mm	5.36mm	6.93mm	5.04mm	7.25mm
6.5mm	5.53mm	7.15mm	5.20mm	7.48mm

The above cross sectional area groove sizes allow for the free movement of the gasket when being compressed. This method of calculation ensures that the volume of the gasket does not exceed that of the groove when fully compressed, resulting in groove overfill. This also minimises the amount of compression force required to achieve a good seal.

It is important to note that when designing in a gasket, that the principles of O-Ring design for pressure sealing do not apply. The groove depth dimension is the most important, as it is this that limits the gasket compression. The groove width has no maximum dimension and is only there for gasket location purposes. Tighter groove dimensions using volume calculations may be employed to enhance environmental sealing. However this will increase the compression forces required.

The above calculations are based on reducing the depth of the groove by a given compression % and increasing the width by the same amount less 5% e.g. 20% reduction in depth 15% increase in width.

When choosing a tube section as a gasket it is recommended that consideration be given to the lower compression forces, making sure that there is enough resilience in the gasket to ensure a good seal. In these cases it is sometimes better to use the volume groove size calculation, with the groove side walls offering support for the tube. Because there are so many variables with tube cross sections it is difficult to give precise information on this subject. Kemtron are able to supply samples for evaluation purposes.

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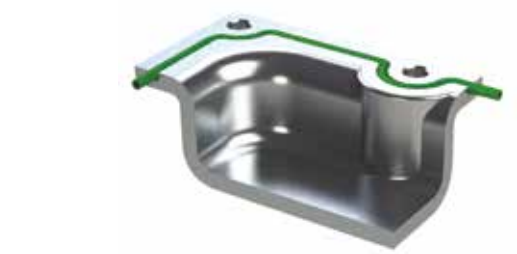
Compressed Gasket

Internal Bend Radius: Casting with Solid Cord Gasket

The minimum internal bend radius of a solid cord gasket is 1.5 x cross section of cord.

Internal Bend Radius: Casting with Tube Gasket



Minimum internal bend radius of a tube gasket where the id of the tube is no greater than 30% of the cross section is 2.5 x cross section of tube.

Materials:

Solid Silicone

General Purpose

Temp Range	Hardness Shore	Colour	Flame Resistance
-60°C – 200°C	40 or 60	Grey / White	None
Diameter: 1.5mm, 2mm, 2.5mm, 3mm, 4mm, 5mm, 6mm			

Solid Flurosilicone

General Purpose

Temp Range	Hardness Shore	Colour	Flame Resistance
-50°C – 200°C	40 or 60	Blue / Green	None
Diameter: 1.5mm, 2mm, 2.5mm, 3mm, 4mm, 5mm, 6mm			

Silicone Sponge

SP16

Temp Range	Density	Colour	Flame Resistance
-55°C – 200°C	250 Kg/M³	Grey / White	None
Diameter: 1.5mm, 2mm, 2.5mm, 3mm, 4mm, 5mm, 6mm			

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