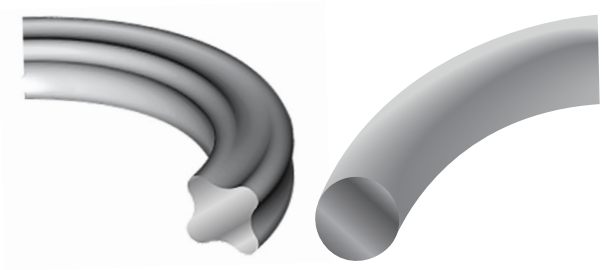
O-Rings and X-Rings

Both O-rings and X-rings are often referred to by the collective term "seals."

CTG's experienced engineers will custom tailor a seal to fit your exact requirements, and manufacture 1 or 1,000 seals to your specifications that same day.

O-rings are sized to the SAE standard AS568, which is known as a dash number. Metric O-rings are sized to the actual measured inside diameter. Custom sizes can be developed to suit your applications.



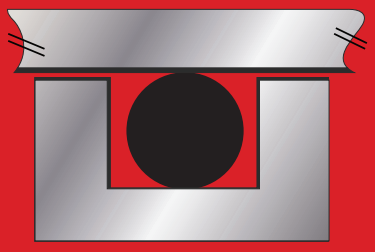
CTG creates O-rings and X-rings to the customer's exact specifications

Design Considerations

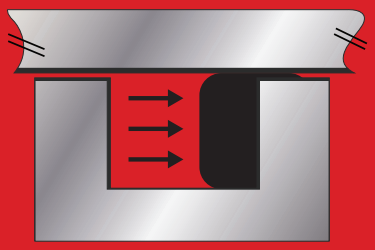
During operation, the O-ring or X-ring is seated in a specially shaped groove (gland) at the interface between two rigid components. When the components are forced closer together, the seal is compressed against the walls of the gland and creates a plug. If a pressure differential occurs across the gland, then the seal is compressed against the low-pressure side of the gland. If the pressure difference is too great, then the seal will extrude into the narrow gap between the walls of the gland, and the seal will fail.

In dynamic applications, a seal can also fail by abrasion against the walls of the gland. In such situations, the walls should be polished to prolong the life of the seal.

For maximum seal longevity, the seal must be constructed from the correct elastomer for the particular application. CTG can build seals from elastomers that tolerate high or low temperatures, high or low pressures, dynamic applications, and corrosive environments. If you are unsure which material would be best, ask us—we can help you select the right material for your situation.



O-ring correctly installed in gland, creating a plug



Excessive pressure on left side of system, causing O-ring to extrude into gap on right

Applications

- High or low temperatures
- High or low pressures
- Static or dynamic systems
- Corrosive environments

Benefits

- Both types of seals provide a simple, inexpensive, and effective plug for many applications
- A wide variety of forms and sizes
- Fabricated from custom materials to meet the exact needs of the application
- X-rings are ideal for dynamic and extreme pressure applications
- O-rings with backup rings increase the effective pressure range of the O-ring

The following table details the materials that are commonly used to construct our O-rings and X-rings. Customers sometimes ask about seals made from other materials. We can do that, too. Let us know the dimensions of the O-ring or X-ring that you need, and we will have your seals ready within a day.

Material	Temperature Range (°F)*	Comments
Nitrile (Buna-N, NBR)	-20 to 212	Highly resistant to abrasion and tearing. Nitrile is the most commonly used elastomer for O-rings and sealing applications, and it is the material of choice for petroleum applications.
Hydrogenated nitrile (HNBR)	-20 to 300	Compared to nitrile, HNBR has better chemical resistance, better heat resistance, and better resistance to seal extrusion.
Ethylene-propylene (EPDM)	-60 to 250	Very resistant to ozone.
Neoprene	-40 to 250	Resists both weathering and exposure to petroleum oils.
Butyl (isobutylene, IIR)	-50 to 250	Extremely low gas permeability; resists a diverse range of chemicals. Useful in applications requiring an air-tight seal.
Viton® (fluorocarbon, fluoroelastomer)	-15 to 400	Better resistance to chemicals and high temperatures than most other elastomers.
Silicone (VMQ, PVMQ)	-150 to 400	Excellent tolerance for temperature extremes, and high resistance to compression set.
Fluorosilicone (FVMQ, FK)	-75 to 400	Tolerant to temperature extremes, and resists degradation by fuel and oils. Primarily used where resistance to hot, dry conditions is required.
FFKM (perfluoroelastomer)	-15 to 600	Highly resistant to many chemicals, and outstanding resistance to high temperatures.
PTFE	-400 to 450	Highly resistant to many chemicals, and can function over a very wide temperature range. Also resists weathering.

* Temperature ranges given here are approximate; the values relevant to any particular situation depend upon the application. If in doubt, ask us—we will help you design an O-ring or X-ring to meet the temperature tolerance needs of your system.

To discuss your application, give us a call!

CTG

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