High Performance Metallic Seals

O-Ring

Description and Application of Metallic “O” Ring Seals

The Candia Technology O-Ring Seals are used when elastomers and other non metallic seals will not seal properly or do not offer the required reliability for the application, usually as a result of temperatures, pressures, or the environment. Candia Technology O-Ring Seals are long lasting seals and unlike non-metallic seasls, they are not subject to failure due to incompatibility with the environment, out gassing or from deterioration due to age. Typical tubing material consists of stainless steel or high temperature alloys such as Inconel. These materials are frequently used because they offer resilient properties that enable the seal to “Spring-Back”. While the majority of seals are circular, maany seals are produced in rectangular, racetrack and other various shapes and configurations. We welcome the opportunity to design a seal to fit your application. Whether you are sealing gases or liquid - 423°F or 2000°F, vacuum to 50,000 PSI. We have the capability to produce a suitable seal from available material.

Application Characteristics

The typical application places a Metallic O-Ring Seal in an axial compression between two parallel surfaces, which are square to the fluid passage or vessel axis. The seal is usually located in an open or closed groove in one of the surfaces. The seal can also be located in a retainer, which eliminates the need for machining a groove. The mating hardware when bolted, torque, clamped or fastened tightly to the surface enclosing the ring, compresses the seal, forming a positive joint.

The following are key elements in specifying the proper seal determining the base material:

• Temperature limits/duration • System pressure • Media to be sealed • Available seating load

Plating and Coatings

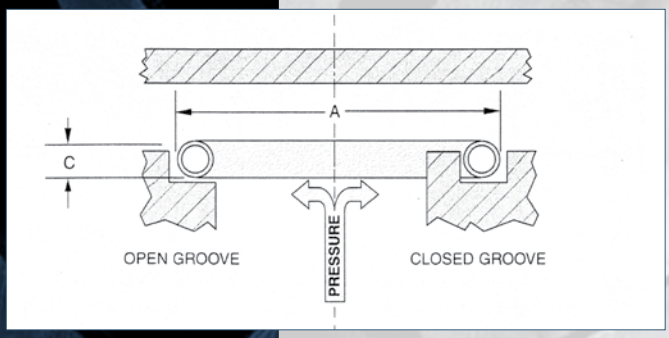
Plating or Coating of the Candia Technology O-Ring Seal provides a soft malleable surface that will smear into small imperfections in the mating hardware. Enhancing seal performance.

Shaped Seals

Metallic O-Ring Seals can be produced in various shapes. The availability of shaped O-Ring permits the design engineer to select the shapes; however, it is recommended to contact our Technical Service staff for design assistance of seal and groove.

Suggested minimum Radii for seals

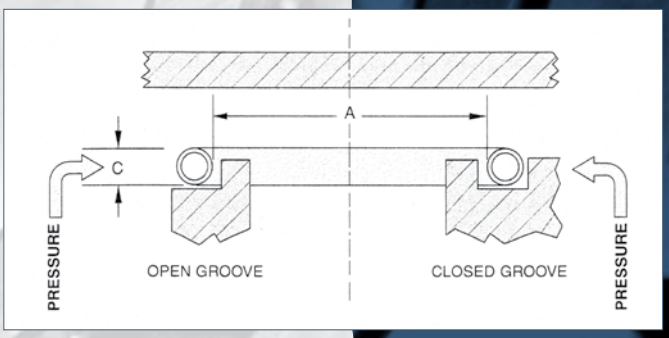
Free Height	Min. Radius
.035”	.125”
.062”	.250”
.094”	.500”
.125”	.750”
.156”	1.50”
.188”	2.00”
.250”	4.00”
.375”	6.00”
.500”	10.00”



INTERNAL PRESSURE EXHIBIT A

SEAL

C		A
Free Height	Tot.	OD Range
.035	+-.003 - .001	.375 - 4.000
.062	+-.003 - .001	.406 - 4.000
.094	+-.003 - .001	1.000 - 12.000
.125	+-.003 - .001	2.000 - 40.000
.156	+-.004 - .000	3.000 - 36.000
.188	+-.005 - .000	4.000 - 48.000
.250	+-.005 - .000	6.000 - 72.000
.375	+-.005 - .000	12.000 - 120.000
.500	+-.006 - .000	24.000 - 120.000



INTERNAL PRESSURE EXHIBIT B

SEAL

C		A
Free Height	Tot.	OD Range
.035	+-.003 - .001	.375 - 4.000
.062	+-.003 - .001	.406 - 4.000
.094	+-.003 - .001	1.000 - 12.000
.125	+-.003 - .001	2.000 - 40.000
.156	+-.004 - .000	3.000 - 36.000
.188	+-.005 - .000	4.000 - 48.000
.250	+-.005 - .000	6.000 - 72.000
.375	+-.005 - .000	12.000 - 120.000
.500	+-.006 - .000	24.000 - 120.000

Loading

The seal is compressed to a prederteminaed height to optimize performance resulting in two uniform contact lines on the face of the seal. As the seal is compressed it deforms elastically to provide maximum resiliency allowing for maximum sealing.

Venting

For pressures over 1000 PSI, seals must be vented. In the vented condition the seal utilizes the system pressure to equalize the pressure within the seal, maintaining acceptable seal stresses and preventing the seal from collapsing.

Sealing Surface Finish

The groove and mating flange face must have a suface finish of 16 Ra for plated or coated seals. For gas and vacuum, a finish of 4 to 8 Ra is recommended. Machining tool marks in groove or flange face must be concentric (circular lay). The seal and mating hardware surfaces must be free from dirt, grit and other foreign materials.

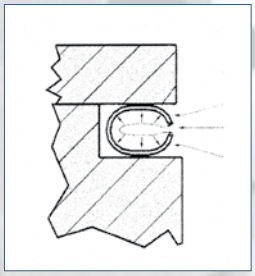
O-Ring Seal Type

Pressure will determine the type of seal that should be selected.

Plain. (Not Self-Energized or Pressure Filled) – Made of metal tubing, usually stainless steel and inconelalloys. This is most economincal O-Ring seal design. It is used for low to moderate pressure and vacuum applications.

Self-Energizing. The inner or outer diameter is vented with small holes or slots. The pressure equalizes with the system pressure by increasing the pressure inside the seal which enhances the performance by permitting the seal to exert increased pressure on the mating hardware. Internal pressure seals are vented on the ID and external pressure seals are vented on the OD.

Ultra-high Vacuum to 1000 PSI: Non Self-Energized



1000 PSI and higher: Self-Energized

For application assistance contact our sales/technical service department.

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