

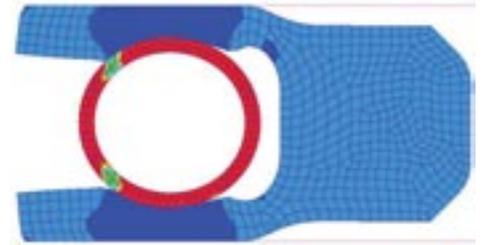
# Special Seal Designs

## Design Capabilities

For more than 30 years SGPPL has dedicated its engineering efforts to solving difficult and unique sealing problems. With each challenge we gained greater insight into the science of specialized sealing.

Today, aided by advanced 3-D modeling software and the latest

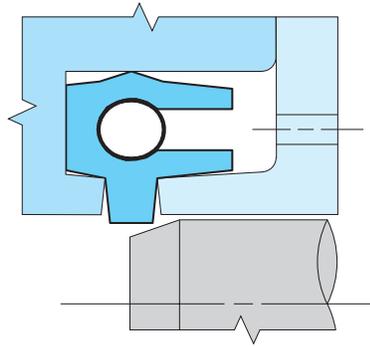
visualizing innovations, our team of skilled design engineers is exploring the next generation of sealing applications. Utilization of Finite Element Analysis (FEA) as a viable design and production tool facilitates higher productivity, design confidence, reduction in testing time and resultant cost savings.



*Finite Element Analysis stress plot simulating seal jacket deflection.*

## Anti-Blowout Seal

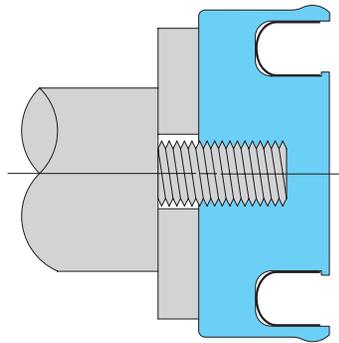
This unique design has been used in the valve industry for over 40 years. In applications requiring the rod to disengage from the seal, the anti-blowout design prevents the dynamic sealing lip from deforming under pressure.



*Anti-blowout seal*

## Integral Piston Seal

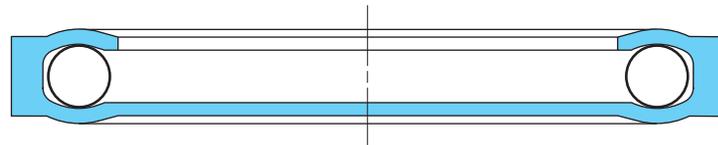
For small diameter applications at moderate pressures, the integral piston seal is an innovative approach to reducing the number of precision machined metal parts and components. In addition to being easy to assemble, this design serves as a seal and as a guide bearing.



*Integral piston seal*

## Diaphragm Seals

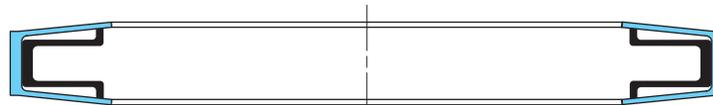
This design combines a flexible disk and static face seal in a single unit. Diaphragm seals offer chemical equipment designers a simple yet advanced method for handling corrosive fluids in actuating valves and small metering pumps.



*Diaphragm seals*

## Machined Spring Face Seal

The machined spring seal is a solid ring of metal covered by a thin PTFE jacket. The solid spring is impermeable to light gases like hydrogen and helium, and provides extremely low leak rate sealing. It is also an excellent face seal for sealing hard vacuums.



*Machined spring face seal*

# Special Seal Designs



Bellevile spring seal

## Belleville Spring Seals

Face seals energized with belleville washers provide high deflection without risk of the spring collapsing. Another advantage of bellevilles is that they can be manufactured in smaller diameters than most spring-energized seals.



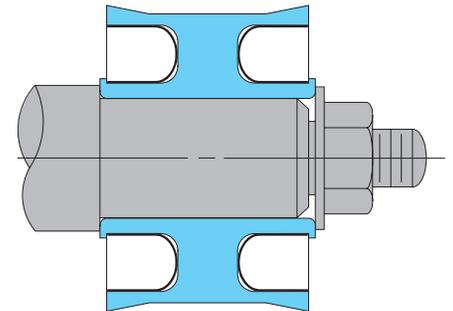
Belleville spring seals



Bi-directional seals

## Bi-Directional Seals

This versatile design combines two seals and a guide bearing into a one-piece component. The bi-directional seal is found in moderate temperature/pressure applications where simple assembly and quick replacement are required. When designed without an inside diameter it also serves as a floating piston.



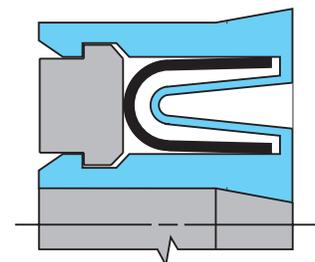
Bi-directional seals



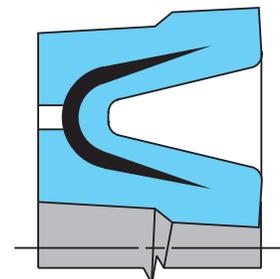
Sanitary seals

## Sanitary Seals

The RS and JS designs shield the spring from the media to prevent entrapment in the spring and allow easier cleaning. Excellent in food filling and other dispensing equipment.



JS seal



RS seal

# Special Seal Designs

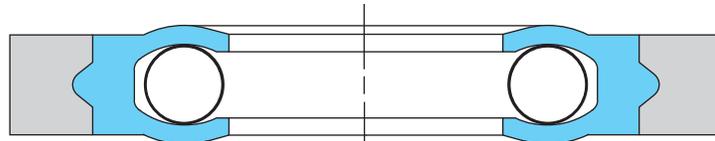


OmniGasket

## OmniGasket

OmniGaskets are spring energized face seals retained in a metal gasket designed to customer specifications. They offer the advantages of a ready-made seal groove (saving hardware design and machining cost), and easy changeout of the seals in the field.

These are two reasons why OmniGaskets are gaining wide acceptance in gas turbine engine and aerospace hydraulic applications.



OmniGasket



Formed seals

## Formed Seals

Formed seals are a unique specialty sealing product. SGPPL has the ability to manufacture most of the major seal cross sections in special shapes to fit the customer's hardware. Successful applications of formed seals include aerospace access doors and liquid heat exchangers.

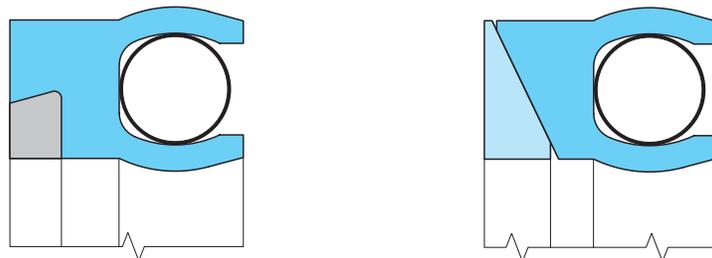


High pressure seals

## High Pressure Seals with Back-Up Rings

A number of design options are available for high-pressure sealing problems. Back-up rings can be configured into most seal types to prevent extrusion of the jacket

material. Pressure actuated back-up rings are often recommended for closing multiple gaps or for dealing with hardware sideloads.



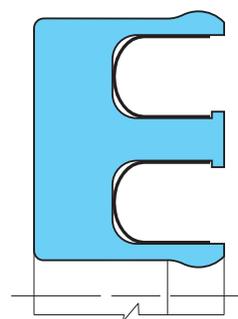
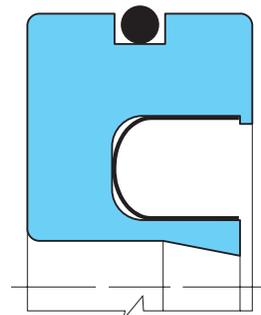
High pressure seals with back-up rings



Multiple energizers

## Multiple Energizers

Seals with more than one energizer are recommended for retrofitting large cross section glands to maintain adequate sealing on both the I.D. and O.D.



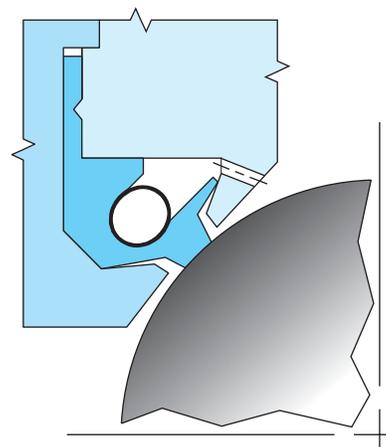
Multiple energizers



Ball valve seals

## Anti-Blowout Ball Valve Seals

Ball valve seals are machined to the exacting tolerances called for by manufacturers. A highly successful example of this type of seal is the anti-blowout design, which is used in petrochemical valves. SGPPL engineers will assist in designing a captive anti-blowout feature into hardware, as shown in the diagram on the right.



Anti-blowout ball valve seals