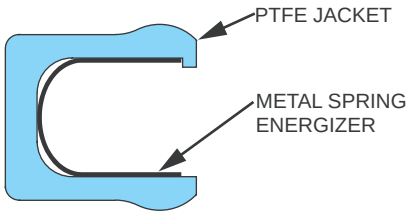
How OmniSeal seals Work

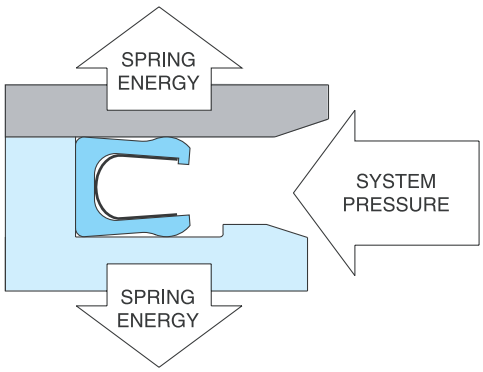
OmniSeal Components



The OmniSeal is a spring actuated, pressure assisted sealing device consisting of a PTFE (or other polymer) jacket, partially encapsulating a corrosion resistant metal spring energiser.

When the OmniSeal is seated in the gland, the spring is under compression, forcing the jacket lips against the gland walls thereby creating a leak-tight seal.

The spring provides permanent resilience to the seal jacket and compensates for material wear and hardware misalignment or eccentricity. System pressure also assists in energizing the seal jacket. Spring loading, assisted by system pressure provides effective sealing at both low and high pressures.



OmniSeal 400A in working conditions

OmniSeal jackets are precision machined from PTFE, filled PTFE composites and other high performance polymers. OmniSeal seals with PTFE jackets are serviceable at temperatures ranging from cryogenic to + 300°C and are inert to virtually all chemicals except molten alkali metals, fluorine gas at high temperature and chlorine trifluoride (ClF_3).

OmniSeal seals are available with a variety of spring energisers, each having characteristics to meet specific requirements. Spring loading can be tailored to meet critical low friction requirements in dynamic applications, or extremely high loading often required for cryogenic sealing. Springs are fabricated from corrosion-resistant metals such as 300 Series and 17-7 PH stainless steels, Elgiloy®, Hastelloy®and Inconel.

OmniSeal seals with elastomer O-rings used as energisers (nitrile, silicone, Fluoroelastomer, OmniFlex™, etc.) are also available by contacting the factory.

The geometry of the OmniSeal installed in the gland, provides positive resistance to torsional or spiral failures often found in O-rings. OmniSeal seals (with metal springs) have unlimited shelf life and are not subject to age controls normally imposed on elastomeric seals.

Selecting an OmniSeal Design

Saint-Gobain Performance Plastics manufacturers and markets a variety of basic styles of spring energised PTFE Fluoroloy® seals. Several of these designs can be used interchangeably in the same gland.

The recommendations that follow are intended as a general guide and should be used together with the tables and dimensional charts that appear on the following pages. Should you require additional assistance, please contact the factory. For complete contact information see the inside back cover.

Static Seals and Dynamic Seals

The two basic types of sealing applications are STATIC SEALS and DYNAMIC SEALS. In static sealing there is essentially no relative motion between the seal and the hardware members. An example would be a seal clamped between bolted flanges.

In dynamic sealing there is relative motion between the two sealing surfaces. A typical example would be the rod and piston seals in a hydraulic cylinder.

There are two directions of motion in dynamic sealing, reciprocating or linear motion, and rotary (including oscillating) motion.

Occasionally there may be a combination of both static and dynamic applications. An additional factor to be considered is the orientation of the seal in the hardware. Seals that are compressed in a radial direction are called radial seals, again using rod and piston seals as examples.

Seals that are compressed in a direction parallel to the axis are called Face Seals, the flange gasket being a typical example.

Typical installations are shown on Page 26.