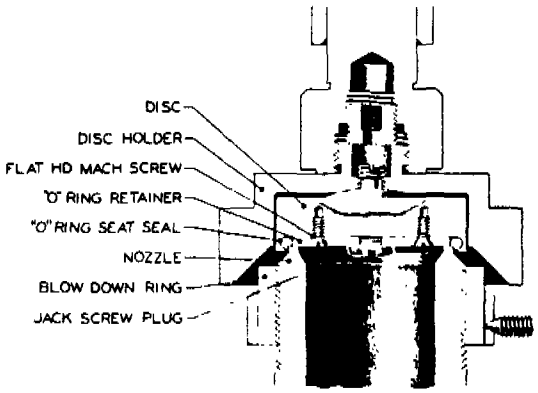
Farris Safety-Relief Valves

2600 Series

Farris "O" Ring Seat Pressure Seal for Conventional or BalanSeal

Eliminates leakage and costly product loss as well as costly down time and maintenance on troublesome applications such as:

- **Operation too close to set pressure.**
- **Light, hard to hold fluids.**
- **Minute foreign particles.**
- **Vibratory applications.**
- **Corrosive fluids.**
- ***Nozzle icing conditions.***
- **Discharge piping strains**



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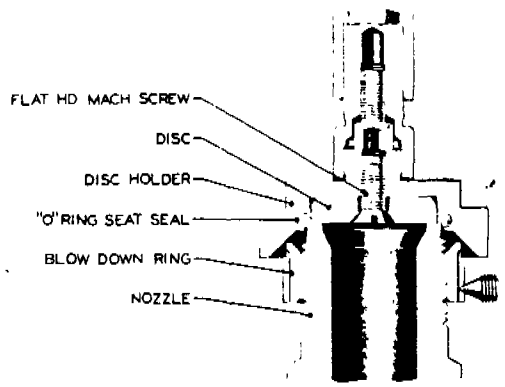

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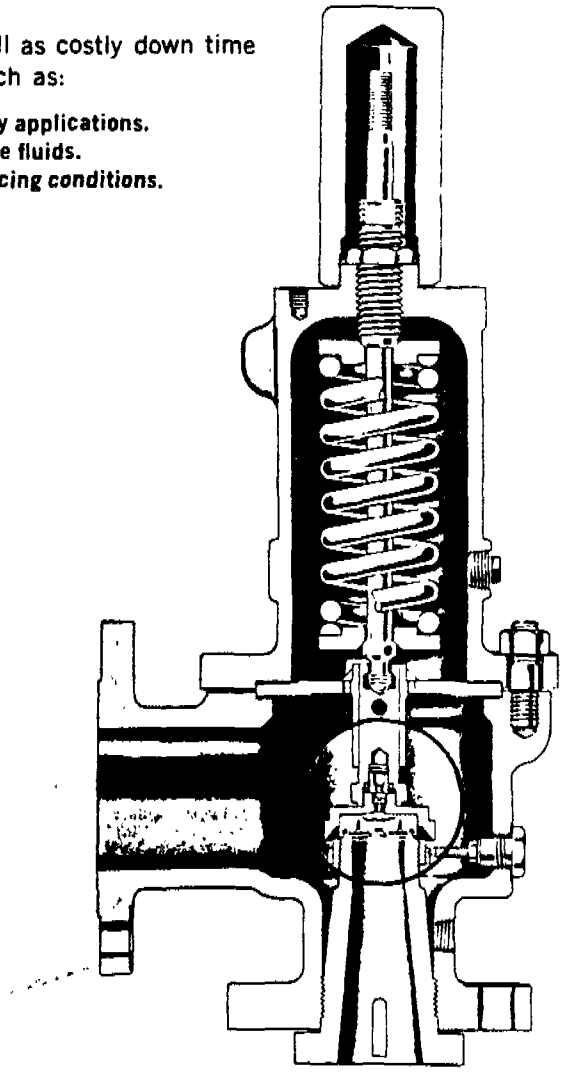


Recognizing the need for a resilient seat in a safety-relief valve for extreme tightness, Farris Engineering Corporation first made available an "O" Ring seat seal in early 1950. Although limited in pressure, the "O" Ring design received phenomenal acceptance since it made possible complete tightness at pressures much closer to the valve set pressure than was ever possible with the standard metal to metal seats.

The present "O" Ring Seat Pressure Seal design is an improvement which allows the use of the "O" Ring Seat Seal to higher pressures and, equally important, the spring load is solely carried by the metal to metal portion of the seat with the "O" Ring becoming a pressure seal within its recessed chamber and the outer edge of the nozzle, assuring the ultimate in tightness.

The "O" Ring Seat Pressure Seal is available in our 2600 Series line of flanged safety-relief valves – conventional or BalanSeal construction – for pressures up to a maximum of 1500 PSIG.

Referring to the selection tables on pages 22 thru 49, substitute a "C" for the fourth digit "A" in the type number for the conventional valve and a "D" for the fourth digit "B" in the type number for the BalanSeal construction when an "O" Ring Seat Seal is required:

26FA10 becomes 26FC10 (Conventional)
26FB10 becomes 26FD10 (BalanSeal)

The pressure limit of the Conventional or BalanSeal valves covered in the selection tables is the same for the O Ring design in all type numbers and orifices with the 150 lb., 300 lb. and 600 lb. inlet flanges. On the "O" Ring design in all type numbers and orifices 1500 lbs. is the limit for the "O" Ring design, not the conventional valve limit shown in the selection tables & charts. Refer to "O" Ring Material Selection Chart on page 21 for Temperature and Pressure ratings of the various "O" Ring materials available.

Why an "O" Ring Seat Pressure Seal?

In the normal operation of a safety-relief valve the disc must lift off the nozzle very slightly to "simmer," allowing pressure build up within the secondary orifice (huddling chamber), causing the valve to "pop" fully open. Simmering occurs many times in the process industries where, as a result of process changes, minor upsets, etc., operating pressure fluctuates higher than normal, causing safety-relief valves to "simmer," but not fully open. This will cause serious misalignment in the valve and after the pressure drops the valve will very often continue to leak below the normal operating pressure.

While this can be overcome by actually popping the valve, this is not always possible. The use of the Farris "O" Ring Seat Pressure Seal will always overcome this difficulty.

As occurs very frequently operating pressures are too close to valve set pressures. As the operating pressure approaches the set pressure, seat loading is diminished reducing the force which affects tightness. With the use of the Farris "O" Ring Seat Pressure Seal, tightness can be obtained at relatively higher operating pressures than with metal to metal or other soft seat safety-relief valves.

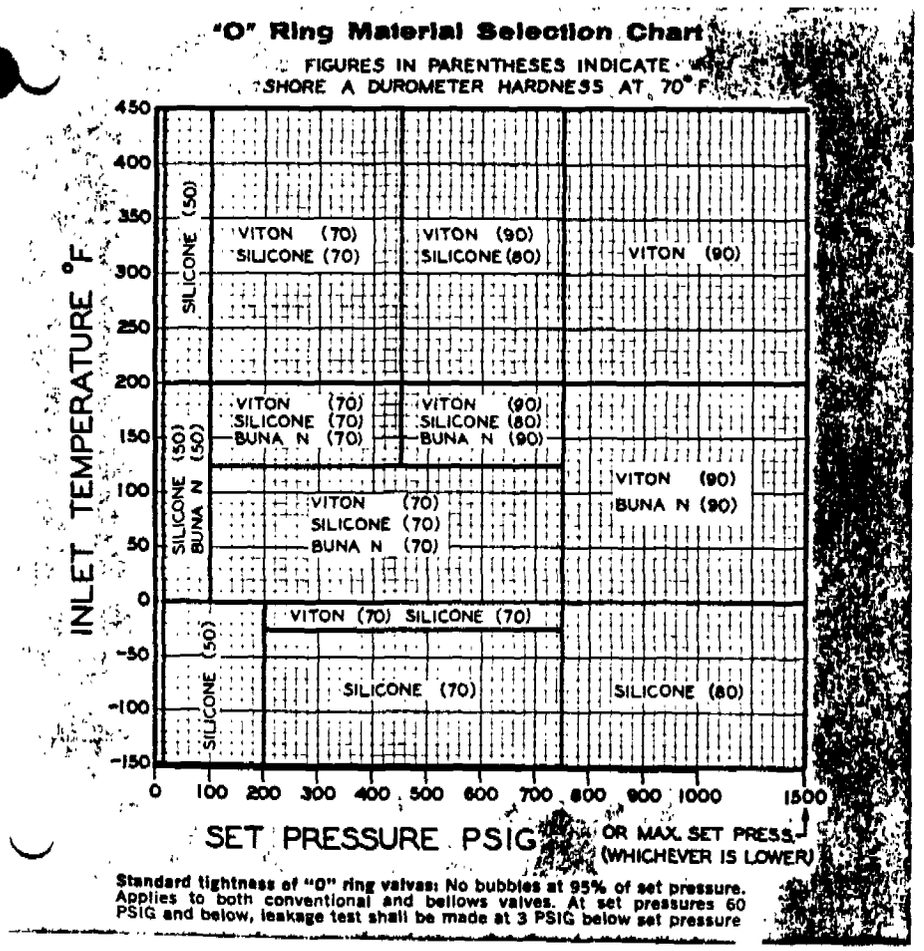
On light, hard to hold fluids such as hydrogen, helium, light hydrocarbon, anhydrous ammonia, etc., metal to metal seats are often penetrated, causing leakage problems. The Farris "O" Ring Seat Pressure Seal will overcome leakage on these hard to hold fluids.

On applications where heavy vibrations occur – i.e. barges, tankers, pumps, compressors, etc., leakage of metal to metal seats develop as a result for as the set pressure is approached the spring force is minimized and the vibration tends to reduce the effect of spring loading, causing leakage. The Farris "O" Ring Seat Pressure Seal will maintain tightness as the spring force is not a factor in the tightness of the "O" Ring design.

Where occasional minute foreign particles are carried in the flowing medium, metal to metal seats are usually marred or scratched when the valve is blowing. This creates troublesome leakage problems after the valve closes. The Farris "O" ring seat pressure seal will absorb without damage the impact of these particles and will eliminate particle deformation of the mating metal seating surface on the nozzle as the valve closes, thus reducing the incidence of leakage in valves on most process units. When necessary, simply replace the "O" ring to maintain tightness.

Due to corrosion, metal to metal seats may eventually leak. With the proper selection of the Farris "O" Ring Seat Pressure Seal tightness can more satisfactorily be maintained.

Nozzle icing conditions result from the refrigerant effect of the flowing media when a valve relieves. Ice actually forms on the seat, thus causing leakage. The Farris "O" Ring Seat Pressure Seal again overcomes this troublesome type of leakage.



Standard tightness of "O" ring valves: No bubbles at 95% of set pressure. Applies to both conventional and bellows valves. At set pressures 60 PSIG and below, leakage test shall be made at 3 PSIG below set pressure

Service recommendations for "O" Ring materials

BUNA N

Air
Anhydrous Ammonia
Butane
Butene
Butylene
Carbon Dioxide
Diesel Oil
Ethyl Ether
Ethylene Glycol
Freons #11 & 12
Fuel Oil
Gasoline
Helium
Hydrogen
Hydrogen Sulphide
Kerosene
Lube Oil
Natural Gas
Nitrogen
Oxygen
Propane
Stoddard Solvent

VITON

Acetylene Tetrabromide
Air
Amyl Alcohol
Arochlor #1248
Benzine
Butadiene
Butane
Butene
Butylene
Carbon Disulphide
Carbon Tetrachloride
Chlorine (Dry Gas)
Cyclohexane
Dowtherm "A"

VITON (con't.)

Ethyl Chloride
Ethylene
Ethylene Glycol
Ethyl Alcohol
Gasoline
Hexane
Hydrochloric Acid
Hydrogen Sulphide
Isobutyl Alcohol
JP-4 Fuel
JP-5 Fuel
Kerosene
Lube Oils
Mercaptan
Methylene Dichloride
Natural Gas
Naphtha
Nitric Acid
Nitrogen
Oronite 8200 & 8515
Propane
Propylene
Propyl Alcohol
Stoddard Solvent
Sulphur Dioxide
Sulphuric Acid
Toluene
Trichloroethylene
Turpentine
Vinegar
Water
Xylene

SILICONE

Air
Helium
Nitrogen
Oxygen

These recommendations are a guide only and service life of the "O" Ring is, of course, dependent on temperature, concentrations, catalysts that may be added and other conditions which are beyond our control