



Tubing Seal Systems

TIW provides tubing seal assemblies that are matched to any type of service. To determine the right seal for a well, four main factors must be considered: maximum pressure differential; maximum and minimum temperatures; chemical composition of the well fluids, including corrosives (CO₂, H₂S, etc.), inhibitors, and seal movement.

Once these factors have been determined, TIW will provide the best combination of steel, seals and accessories.

Steel Grades

TIW can supply three grades of steel for the metal parts of the Tubing Seal Assemblies.

- Alloy steel, heat-treated to a maximum hardness of 22 Rc.
- Alloy steel, heat-treated to a maximum hardness of 36 Rc.
- Stainless steel and other alloys used for CO₂ service and some H₂S service.

Contact TIW for the grades and specifications needed to meet specific well conditions.

SS Seals are available in Nitrile or Viton Chevron seals and steel spacer rings. The Nitrile rings are used for non-H₂S environments not exceeding 240°F and are not recommended for low-temperature gas applications (less than 40°F). The Viton seals are for use in mild H₂S service in all well fluids (except amine-based inhibitors) up to 400°F.

ST-A Seals consist of Viton/Aramid Glass Fiber or Chevron seals backed up by Teflon rings. These seals have been tested to 400°F and 12,000 psi.

SSS Seals resist the effects of H₂S, CO₂, amine inhibitors and highly corrosive treatment fluids. They consist of Kalrez® Chevron seals backed up by Ryton® and Teflon rings. TIW has tested these seal stacks at 450°F and 15,000 psi differential under static conditions and 10,000 psi under dynamic conditions. TIW recommends keeping seal movement to a minimum and keeping the seals in the seal bore.

LP2 Seal

The LP2 Seal consist of an LP seal backed up by PTFE V-rings and PEEK space rings. The LP2 seal stack has been successfully tested to 15,000 psi differential at 450°F under dynamic conditions. The LP2 ring design combines the PTFE along with the elastomer to form one seal ring. This makes the ring more resilient than an all-PTFE ring and stronger and more stable than a homogeneous ring. The PTFE forms a jacket that protects the elastomer from frictional drag and media. The seal stack is designed for dynamic movement into and out of a seal bore while under pressure.

Molded Seal

Molded Seal Units are available in Nitrile, Viton, HSN and Aflas® and are designed to resist wear due to seal movement. Under moderate to high pressures, the Molded Seal Units can withstand movement in and out of the seal bore without causing damage to the seal itself.

Packer Seal System Selection Guide

SEAL DESIGN	RECOMMENDED SERVICE TEMPERATURES AND PRESSURE DIFFERENTIALS	
	OIL-BASED PACKER FLUID	CORROSIVE GASES
SS Seal (Nitrile)	250°F @ 6,000 psi	Not Recommended
SS Seal (Viton)	400°F @ 5,000 psi	Not Recommended
Molded Seal Unit (HSN)	325°F @ 7,500 psi	Not Recommended
STA Seal (Viton/Aramid Glass & Teflon)	400°F @ 10,000-12,000 psi	Not Recommended
SSS Seal (KTR)	550°F @ 10,000 psi	550°F at 10,000 psi
SSS Seal w/Aflas® (ATR)	450°F @ 10,000 psi	450°F at 10,000 psi
LP2 Seal	450°F @ 15,000 psi	450°F at 15,000 psi

Oil based packer fluid: essentially a mineral fluid diesel oil.

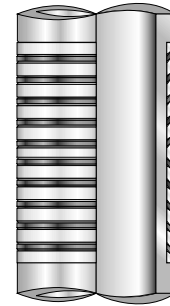
Corrosive gases: H₂S, more than 4%
CO₂, more than 4%

The information contained in this chart is based on test data published by various polymer suppliers and our experience to date; therefore, we believe it to be accurate. We assume no liability in connection with its use, as it is intended *only* as a guide for the user's discretion and risk.

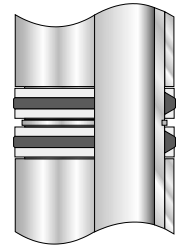
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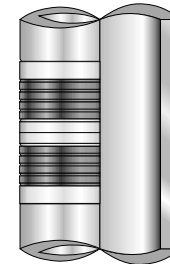
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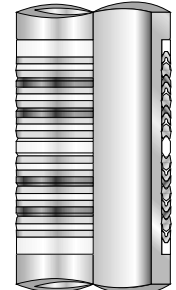
SS Seal



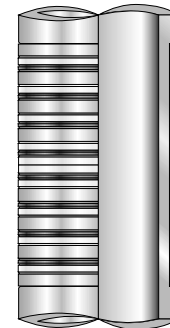
Molded Seal Detail



ST-A Seal



LP2 Seal



SSS Seal