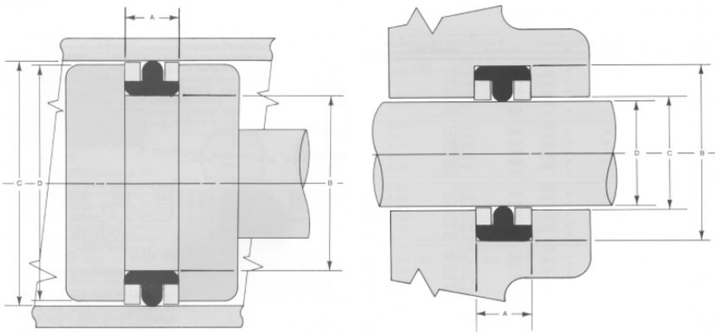
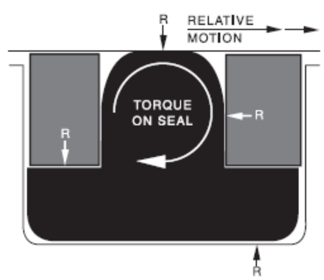
Industrial T-Seals



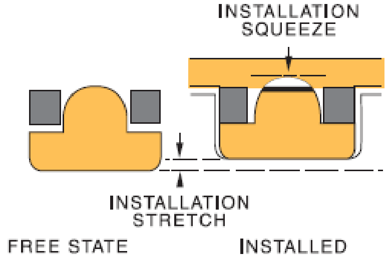
A SEAL USABLE IN STANDARD O-RING GROOVES WITH BUILT-IN RESISTANCE TO SPIRALLING AND EXTRUSION

T-seals were originally developed to preserve advantages of O-rings in dynamic fluid power applications while ending two of their most serious reliability problems: (1) extrusion through the gap between static and dynamic surfaces, and (2) instability in their grooves, which led to spiral or twisting failure. The T-seal eliminates both of these problems while retaining the space-saving attributes of the compact O-ring groove. Above all, the T-seal meets or exceeds the O-ring's outstanding ability to seal at all pressures and temperatures.
Parker T-seals have been developed to replace existing O-ring seals in long-lived hydraulic and pneumatic systems. Their ability to fit into existing grooves means that a retrofit can be made with no re-machining or major revisions to the existing hardware design. This simplifies both field changes and new equipment manufacturing.
The T-seals' distinctive cross-section is extremely functional. The elastomeric seal element consists of a flange and a body, each of which has a multiple purpose. The flange provides the static seal against the bottom of the groove, provides positive radial actuation of the back-up rings, and stabilizes the seal against rolling in the grooves. The body provides the squeeze or interference seal against the dynamic surface, loads the flange to enhance the static seal against the groove, and contributes elastomeric mass to the downstream flange to displace the backup ring radially. The squeeze effected during installation duplicates that of an O-ring, giving the T-seal its ability to seal at the lowest pressures. Finally, the square or rectangular shape of the T-seal assembly with its back-up rings eliminates the spiral failure mode characteristic of O-rings. Parker T-seals cannot spiral fail.

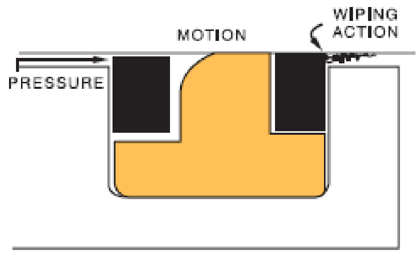


Back-up rings are on the outside diameters of piston T-seals, and the inside diameters of rod T-seals. The unique "hydraulic" loading of the back-up rings by the T-seal flanges that occur when the installed seal assembly is exposed to differential pressure causes positive back-up ring actuation. It is the positive actuation that allows the T-seal back-up rings to respond more rapidly than the plastic deformation that causes O-ring back-up rings to close an extrusion gap. For this reason T-seals adapt to wider gaps, and respond to shocks and pressure surges immediately by increasing the radial force against the dynamic surface.

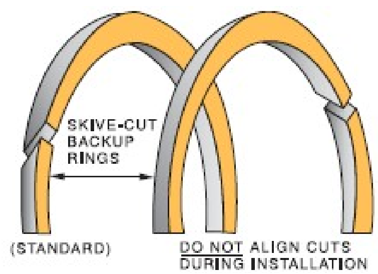
It should be remembered that extrusion gaps are seldom constant throughout a stroke. The gap may vary due to uneven wear along a rod or bore, it may vary as system pressure rises (breathing) and distance from end restraints changes (thereby changing the stretch of cylinder walls). Ovality of cylinder tubes or rod glands due to side-load is not necessarily constant throughout the stroke, and out-of-round tubes may assume a near perfect circular shape where restrained by the end caps. These numerous possible sources of changing extrusion gaps make Parker T-seals' speed of response extremely valuable. Despite rapid strokes, lateral shock loads, pressure surges, and uneven wear or stretching, Parker T-seals maintain zero extrusion gaps. In the free-state, back-up rings appear quite loose on their seal element. This slack is taken up during installation, however, since the interference fit of the seal in standard O-ring grooves either stretches (piston seals) or compresses (rod seals) the element to seat the backups. Parker T-seals are easy to assemble and may be inserted into their grooves manually without special assembly tools.



The Parker T-seal back-up rings' ability to follow changing dynamic surfaces rapidly also makes them very effective wipers, keeping contaminants away from the sealing line.



Standard to Parker T-seals are skive-cut back-up rings. Skive cut rings are simple to install and allow harder and more extrusion-resistant materials to be used without sacrificing their ability to respond quickly to gap changes.



Elastomeric Seal

Base Polymer	Compound Number	Durometer	Temperature Range °F	Service
Ethylene Propylene	E4183A E4259A	80 80	-65°F/+275°F	Skydrol[1] and other phosphate esters, water, dilute acids and alkalis.
Fluorocarbon[2]	V4205A V4208A	75 90	-20°F/+400°F	High temperature oils, aromatic solvents, industrial phosphate esters.
Neoprene	C4107A	70	-40°F/+300°F	Refrigerants.
Nitrile	N4115A	75	-40°F/+225°F	Standard material - for petroleum based hydraulic and lubricating oils, pneumatics.
	N4182A	70	-65°F/+275°F	Low temperature hydraulic fluid applications.
	N4187A	70	-40°F/+250°F	Petroleum based oils and fuels.
	N4242A	70	-65°F/+275°F	Low temperature petroleum based hydraulic fluid applications.
Nitroxile	N4257A	80	-20°F/+250°F	Petroleum based fluids, high water content fluids, abrasion/wear resistance.
	N4274A	85	-20°F/+250°F	Low friction, long wearing (ELF) extremely low friction.

Back-up Ring

Base Material	Compound Number	Temperature Range °F	Service
Nylatron	B001	-65°F/+250°F	Standard material -most hydraulic/pneumatic service.
TFE Resin	B011	-65°F/+350°F	High temperature hydraulic and chemical resistant. For +350°F to +450°F service - Consult factory.

[1] TM ® Monsanto Co. [2] Viton ® /DuPont; Fluorel ® /3M