CGT™ RINGS

CAPPED GT RING SEALING SYSTEM

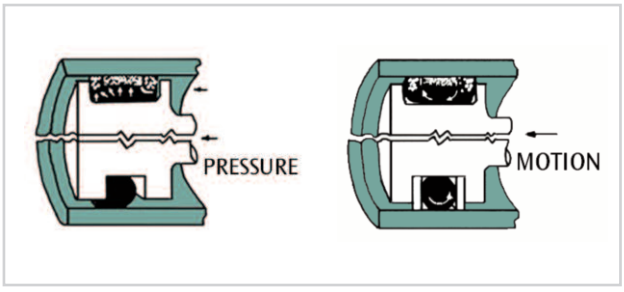
The Greene, Tweed Capped G-T® Ring is a double-acting, high-pressure piston seal that combines the space-saving and non-extrusion features of more conventional compression-type seals with the low-friction, long-life characteristics of O-ring energized TFE cap-type seals.

A positive seal that offers a high degree of sealability in both high and low pressure environments, the CGT™ Ring is designed to handle temperature extremes, a wide variety of fluid media and larger than normal clearances—yet requires a short axial length gland, and assembles and installs easily in the shop or in the field. Further, the CGT Ring is especially suited for long-stroke applications due to its low sliding friction and unique geometry which prevents roll and spiral.

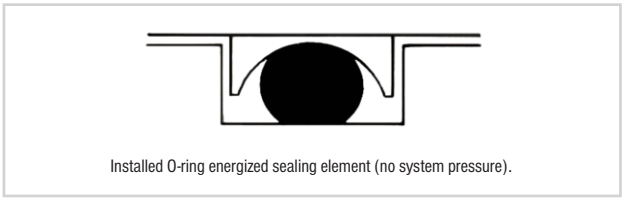
ELASTOMERIC SEAL PROBLEMS

In designing, with many elastomeric compression-type seals, engineers have to deal with inherently higher friction as well as roll, spiral, nibble and extrusion failure problems which severely limit the performance envelope (Figures 1 and 2). The CGT Ring solves these problems, its geometry providing the high degree of stability necessary to overcome roll and spiral (especially useful in long-stroke applications) and its radially-energized backup rings preventing the "T" shaped elastomeric sealing element or TFE cap from wedging into the diametral clearance or pinching off under motion or pressure (Figure 2).

And, because the CGT Ring's TFE cap is radially loaded in direct proportion to applied pressure levels, frictional losses and wear are reduced to an absolute minimum—while full sealability and prolonged seal life are maintained (Figure 7).



Figures 1 and 2

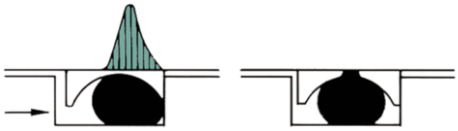


Installed O-ring energized sealing element (no system pressure).

Figure 3

PISTON DRIFT, PREMATURE FAILURE

Unlike conventional cap-type seals, the CGT Ring virtually eliminates piston drift. Piston drift is caused by low pressure leakage past the cap. Because conventional caps (Figure 3) are not adequately energized at low pressures, leakage can occur—ultimately resulting in piston drift. The CGT Ring's cap is adequately loaded both in the static mode through high energizer squeeze, and in the dynamic mode through the proportional axial-to-radial conversion of system pressure levels. Thus, a fully positive seal is maintained throughout the pressure range. And, the CGT Ring's substantial, uniform cap permits a high degree of evenly distributed radial load, virtually eliminating the possibility of excessive wear and premature failure found in conventional cap-type seals (Figures 4 and 5).



Sealing force distribution with system pressure applied.

O-ring energizer creates high peak force concentration.

Peak force concentration causes localized wear, resulting in eventual fracture of "cap."

Figures 4 and 5

OPTIMUM ELEMENT DESIGN

Unlike conventional compression-type seals and O-ring energized TFE cap seals, each of the CGT™ Ring's elements can be designed to perform a specific task by optimizing desired properties, dramatically reducing materials compromises that would normally be made. The "T"-shaped elastomeric energizer must transform axial pressure to radial loading, and thus is compounded for low compression set and high modulus. The low friction sealing element (cap) is designed for sealability and optimal wear resistance, resulting in long operational life—in comparison with conventional caps the design of which must be compromised so that the combination of extrusion resistance, wear resistance and sealability are adequately provided for. Finally, the CGT Ring's anti-extrusion rings have been designed based on the use of Greene, Tweed's high shear strength NWR (wear-resistant nylon) material to provide stability and superior extrusion protection.

Figures 7 and 8 illustrate the CGT Ring's evenly distributed radial loading. An improvement over conventional cap seals, this uniform distribution prevents localized cap wear (Figures 4 and 5) and results in substantially increased service life.

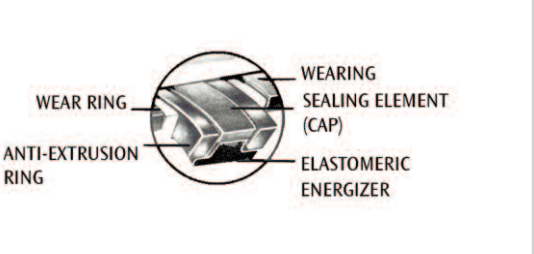
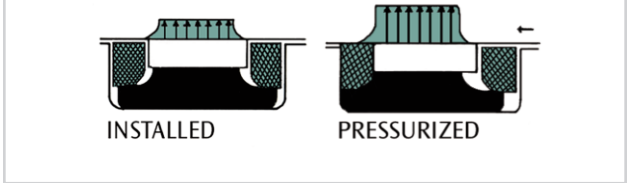


Figure 6



Figures 7 and 8

CLEARANCE LIMITS

Wider clearances can be used when designing with the CGT Ring. This allows for the use of wear rings which eliminate the possibility of piston and bore damage due to metal-to-metal contact. Please consult Non-Metallic Wear Rings and Bearing Materials Bulletin for design information on Greene, Tweed's #911 wear rings.

SPACE REDUCTION

The CGT Ring is ideal for use on components where axial space is at a premium. When replacing single or multiple lip seals, a substantial reduction in piston length can be achieved (even with the addition of wear rings). And, this reduction does not come at the expense of clearance limits or performance. Please refer to Table 1 for dimensional information.

SYSTEM CONTAMINATION

Where grit may become trapped between seal and dynamic surface in conventional systems, the CGT Ring's anti-extrusion rings serve as bore wipers, pre-cleaning the seal path and significantly reducing contamination-caused wear.

SURFACE FINISHES

Recommended TFE caps – 4 to 16 RMS; elastomeric (hydraulic fluids) – 8 to 16 RMS; elastomeric gasses) – 8 to 12 RMS; static – 32 RMS max.

Greene Tweed

www.gtweed.com

Contact Us

Greene, Tweed
Energy
1930 Rankin Road
Houston, TX, USA

Tel: +1.281.765.4500
Tel: +1.800.927.3301
Fax: +1.281.821.2696