



# AGT<sup>®</sup> RING

## HIGH-PERFORMANCE BIDIRECTIONAL SEALS

Greene, Tweed's AGT<sup>®</sup> ring, a double-acting rod or piston seal, provides the quality and reliability the Aerospace industry requires. The AGT ring offers an outstanding combination of easy installation, low leakage and long service life for exceptional performance in many static and dynamic sealing applications.

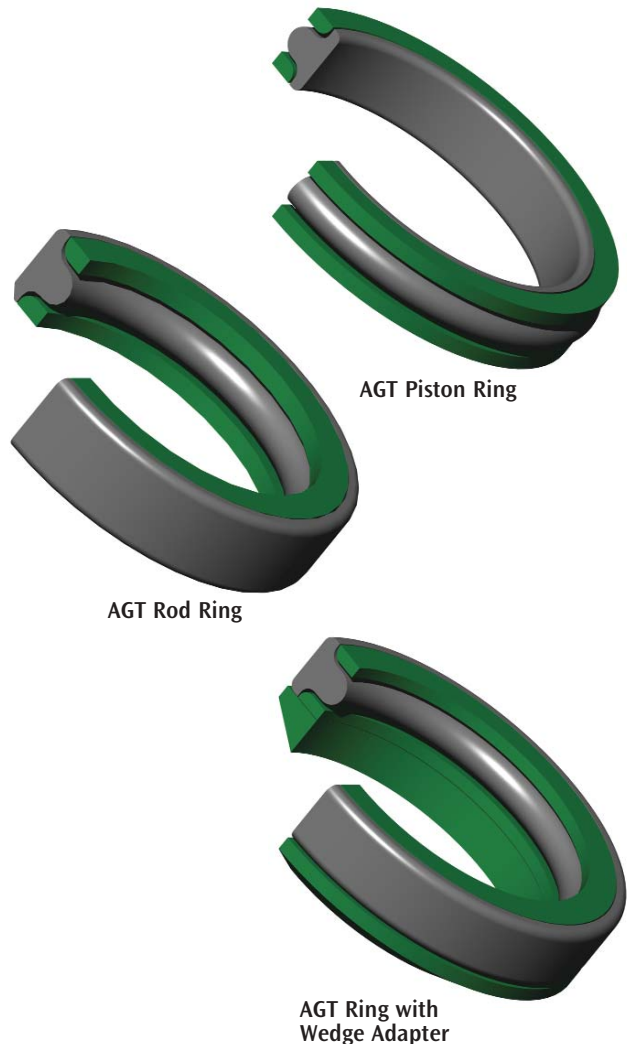
Constructed of superior elastomers and thermoplastics to withstand harsh fluid and service conditions, the AGT ring resists O-ring roll and spiral failure.

## FEATURES & BENEFITS

- Pressure responsive action causes hydromechanic activation of anti-extrusion rings
- Geometrically locked assembly and wide base "T" geometry eliminate seal roll and spiral failure
- Optimization of anti-extrusion ring material can extend seal life, lower leakage and aid sealability
- Retrofits existing MIL-G-5514/AS4716 and AS4832 glands
- Broad fluid and temperature resistance

## APPLICATIONS

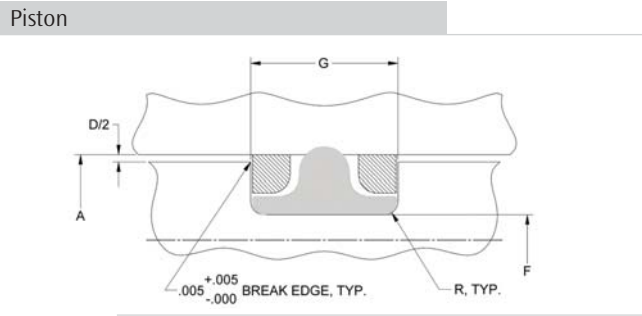
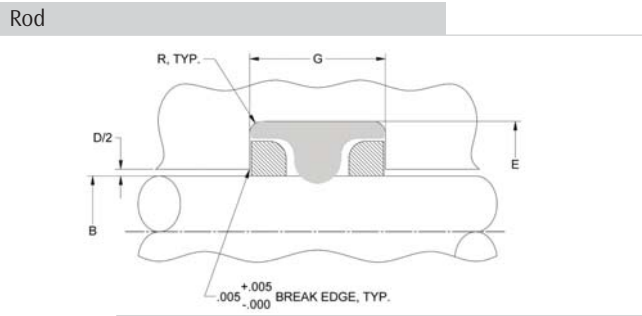
- Landing gear (e.g., end caps and static seals for actuators)
- Accumulators and reservoirs
- Actuators (e.g., door actuators)
- Flight controls (e.g., spoilers, rudders, aileron, etc)



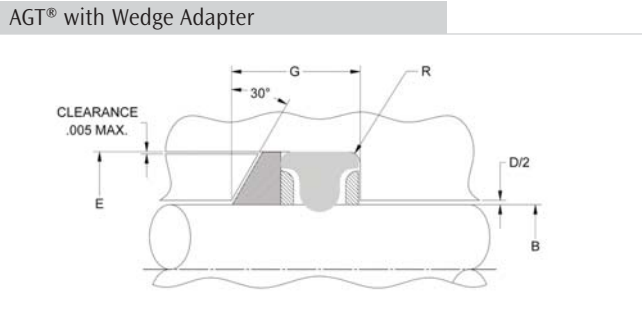
## DIAMETRICAL CLEARANCES

For pressures up to 4,000 psi (276 bar), we recommend standard diametrical clearances per MIL-G-5514/AS4716 and AS4832, providing proper gland lengths and materials are selected.

### Gland Dimensions



Note: Dimensions as specified in MIL-G-5514/AS4716.



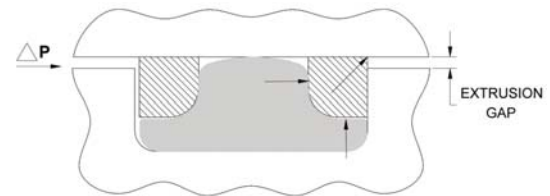
Note: Custom configurations are available to suit BACS11AA. Contact GT engineering for more information.

## AGT DESIGN

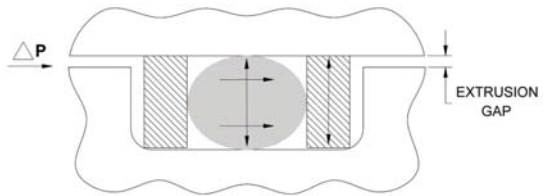
### Pressure Responsive Anti-Extrusion Rings

The AGT ring will completely bridge any extrusion gap by hydro-mechanically “lifting” the anti-extrusion rings in phase with the pressurization of the elastomeric flange supporting the rings. Materials used include high shear and creep resistant fluoropolymers and thermoplastics rated to extreme pressures and clearance gaps typical of landing/recoil systems, pressure vessels and applications with wear rings or independent running bearings. These anti-extrusion materials can be tailored to any given pressure, temperature and clearance gap condition. O-ring anti-extrusion rings, on the other hand, are dependent upon the deformation characteristics of the selected material to radially bridge the clearance gap.

### AGT Ring Advantage



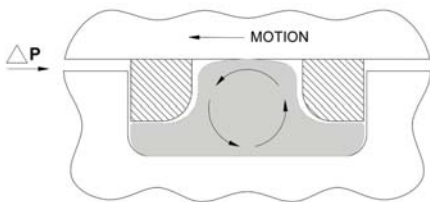
### O-ring Anti-Extrusion Action



### Spiral Resistant

Geometric stability within the gland cavity is an important asset of any seal design. Typical O-ring and anti-extrusion assemblies can torsionally twist within the gland relative to the sliding contact surface. This rolling action can be caused by low differential pressures (as seen in accumulators and compensators), long stroke actuators (such as thrust reverse and door actuator systems), the side loading characteristic of landing gear design, a lack of oil film lubrication and/or residual contamination within the seal area, and the selection of small cross-sectional seal sizes relative to the diameter. Simply stated, the AGT® ring is a geometrically “locked” assembly—it will not roll within the gland due to the placement of the anti-extrusion rings and the rectangular shape of the unit assembly.

Spiral Resistant AGT Ring

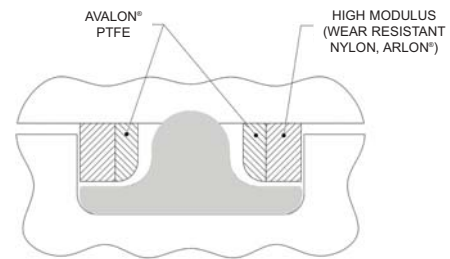


### AGT RING OPTIONS

#### “Staged” and “Split-Lock” Anti-Extrusion Ring Set

It is possible, within wide base gland arrangements, to “stage” two anti-extrusion ring materials on each side of the elastomeric sealing stem in order to accommodate high acceleration and pressure rates. The “softer” in-board PTFE material will protect the elastomer from abrasion and nibbling while the higher modulus out-board anti-extrusion ring performs the required anti-extrusion function.

Staged Anti-Extrusion Ring

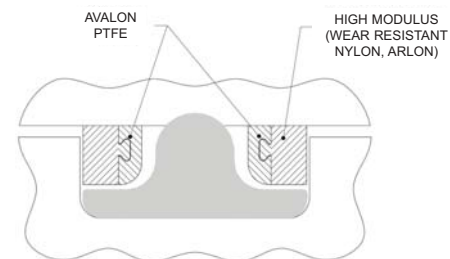


Staged rings can also be provided with our patented “split-lock” design. Each independent scarf cut ring is interlocked along the radial face simulating the ease of assembly of a one-piece continuous or endless anti-extrusion.

The ring halves are dovetailed together, allowing the ring set to expand—“open”—for easier assembly than typical piston-type glands. For rod-type assemblies the gland must be open ended, permitting the locked ring sets to be placed down in the gland. This produces a stable ring within the gland that will not dislodge and become sheared during a blind assembly or with rotational motion typical of threaded end caps. Split-lock rings are ideal for field repair of landing gear shock struts.

*Note: For rod-type assemblies the gland must be open ended, permitting the locked ring sets to be placed down in the gland.*

“Split-Lock” Anti-Extrusion Ring



### HPGT Anti-Extrusion Ring

The advent of Aerospace hydraulic systems that can withstand over 5,000 psi (345 bar) has pushed the need for “HP” (high-pressure, high-performance) sealing systems.

Criteria for high-pressure, high-performance sealing systems include:

- Impulse pressures greater than 5,000 psi (345 bar)
- System temperatures approaching 350°F (177°C)
- Impulse frequency greater than 1 Hz
- Aggressive fluid media (CTFE)

The Greene, Tweed HPGT is a bidirectional rod or piston back-up ring designed for MIL-G-5514/AS4716 grooves. The HPGT uses bias cuts instead of scarf cuts in the high-modulus, anti-extrusion rings required for this level of maximum service. This bias cut configuration prevents extrusion of the elastomeric flange via the scarf cut.

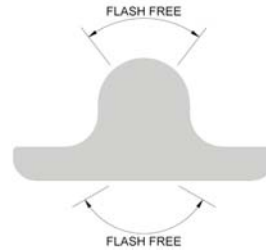


HPGT Ring

### “Flash Free” Option

Typical O-ring and generic “T” rings are molded with a parting line around the critical ID and OD sealing surfaces. This inherent interruption on the contact surface can lead to bypass seepage when sealing low molecular weight gases and liquids in low-pressure accumulators/reservoir applications. Greene, Tweed offers an “E” type Flash free AGT® ring for users requiring the highest level of sealing efficiency.

#### Flash Free AGT Ring

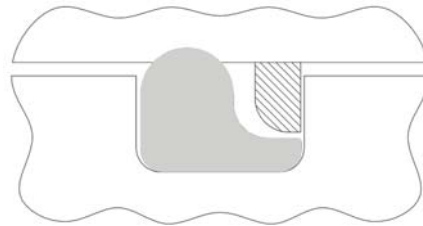


*\*Note: The ID of the flash free option cannot be less than 0.422 in.*

### Unidirectional (AGTL™) Option

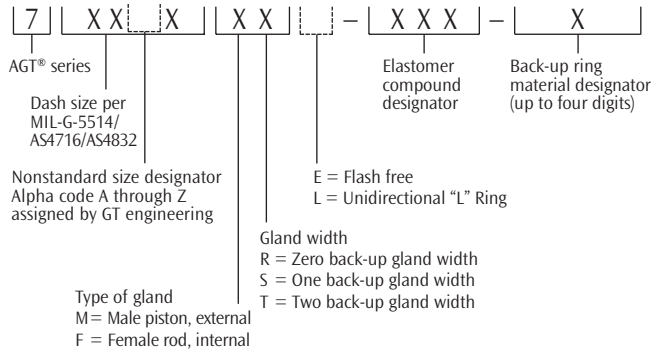
For installations where pressure is unidirectional, the AGTL™ ring offers a compact space saving design within the “zero anti-extrusion” and “one anti-extrusion” length glands if required. The “L” Ring sealing element with integral pressure responsive anti-extrusion ring provides an optimum axial seal footprint with a thicker anti-extrusion ring suitable for larger clearance gaps and higher pressures.

#### Unidirectional

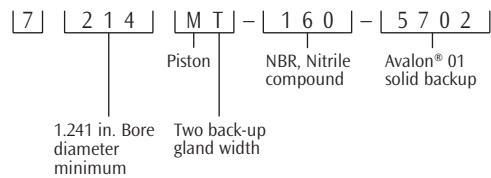


## AGT® PART NUMBERING SYSTEM

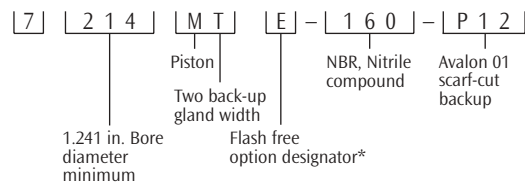
The part numbering system requires the use of the material designator tables found in the next column. For nonstandard designs contact GT engineering.



### General Part Numbering Example

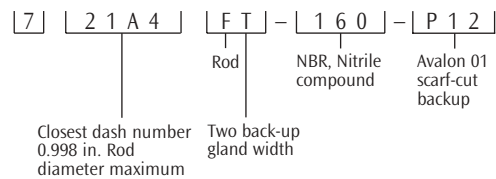


### Flash Free Part Numbering Example



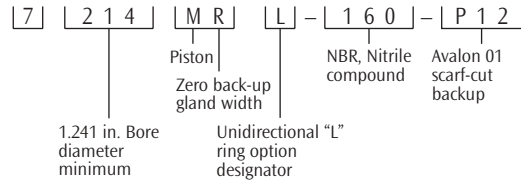
\*Note: The ID of the flash free option cannot be less than 0.422 in.

### Nonstandard Size Part Numbering Example



Contact your local Greene, Tweed representative for specific recommendations to suit higher performance requirements.

### Unidirectional Size Part Numbering Example



### Material Designator Tables

| CODE | ELASTOMER COMPOUND         |
|------|----------------------------|
| 160  | NBR, Nitrile               |
| 161  | NBR, Nitrile               |
| 409  | FVMQ, Fluorosilicone       |
| 410  | FVMQ, Fluorosilicone       |
| 731  | FKM, Fluorocarbon          |
| 772  | FKM, Fluorocarbon          |
| 952  | EPM, Ethylene Propylene    |
| 954  | EPDM, Ethylene Propylene   |
| 964  | NBR, Nitrile               |
| 965  | HNBR, Hydrogenated Nitrile |
| 987  | NBR, Nitrile               |

| BACK-UP MATERIAL       |            |          |                      |
|------------------------|------------|----------|----------------------|
| SPLIT CODE (SCARF-CUT) | SOLID CODE | HP CODE  | MATERIAL             |
| P12                    | 5702       |          | Avalon 01            |
| P2                     | 9173       |          | Avalon 07            |
| P4                     | 5711       |          | Avalon 09            |
| P17                    | 5704       |          | Avalon 44            |
| T7                     | 5757       |          | Avalon 57            |
| P20                    | 5715       |          | Avalon 69            |
| P15                    | 9175       |          | Avalon 89            |
| N                      | 5717       | B206     | NWR                  |
| P9                     | 5712       | B245     | Arlon® 1000          |
| P8                     | 5825       | B238     | Arlon 1330           |
| P22                    | 5703       | B235     | Arlon 1555           |
| STAGED CODE            |            | MATERIAL |                      |
|                        | 4710       |          | Avalon 09/Arlon 1330 |
|                        | 4781       |          | Avalon 01/NWR        |
| SPLIT-LOCK CODE        |            | MATERIAL |                      |
|                        | 4551       |          | Avalon 56/Arlon 1305 |
|                        | 4782       |          | Avalon 01/NWR        |

See GT Surface Finish guidelines.



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