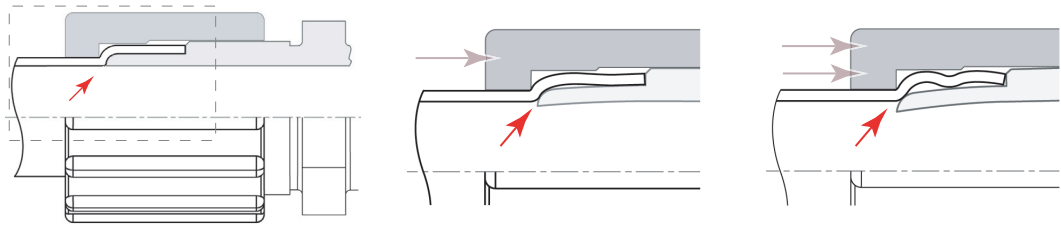


Fluoropolymer Fittings

What Makes A Superior Tube Seal?

Figure 1. The Problem: Axial Nut Torque & Mechanical Deflection in "Flared" Fittings.



1 Tube installed - no nut torque applied

Polymer tubing - when hot or cold 'flared' skillfully - forms a reasonably tight seal at the leading-edge of the flare mandrel prior to axial nut forces (nut torque) being applied.

2 Initial application of axial nut torque

Axial nut forces create fitting's primary tube seal - and grip - by 'pinching' the tube between flare and nut.

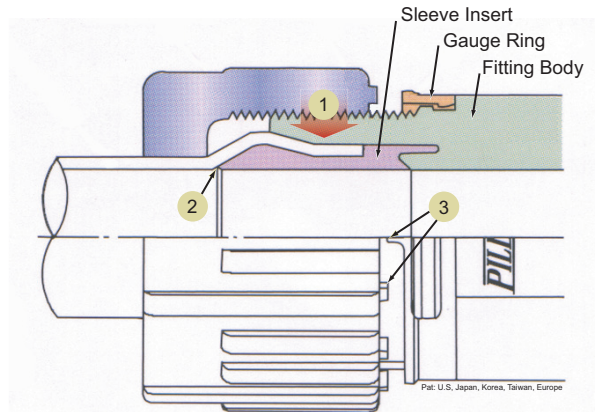
The axial force required to seal and retain the tube also results in mechanical deflection of the flare mandrel into the flow path.

3 Strong application of axial nut torque

Strong axial torque - applied initially, via re-torque or after leaks have occurred - increases the mechanical deflection and further degrades the tube seal.

Actual sealing and tube-gripping surface is very small. Particle agglomeration in voids, heat/pressure cycling and polymer 'creep' become contributors to fitting failure. Flowpath is restricted.

Figure 2. The Solution: Pillar's "Super 300" - Radial (not Axial) Forces Create a Secure Seal.



1 Large tube-gripping surface-area

Threading on the union nut compresses the fitting body, trapping the tube end securely between the removable sleeve-insert and the tube bore. 360° radial forces, spread over this large surface area, provide superior tube retention strength and stability under all conditions.

2 Leading-edge seal remains intact

Sleeve-insert and union nut are calibrated to provide optimum seal pressure at the leading-edge without causing mechanical deflection into the flow path.

Since primary tube-gripping is not performed at this point - as in other fittings - axial nut forces are low resulting in the cleanest possible flowpath.

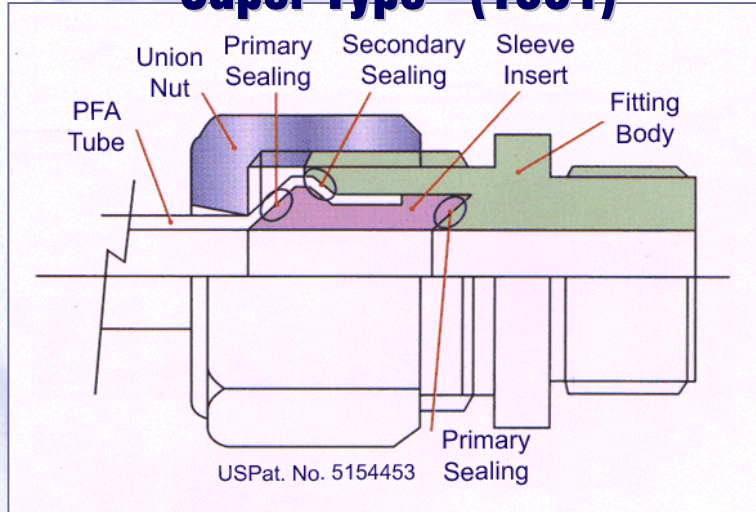
3 Gauge-ring eliminates 'guess-work'

The integrated gauge-ring insures an optimum seal is achieved on every installation. Over-tightening - and the mechanical deflection common in other fitting types - is prevented.

Corresponding 'nubs' on gauge-ring and nut radius provide a positive 'click' when maximum nut torque is achieved (shown).



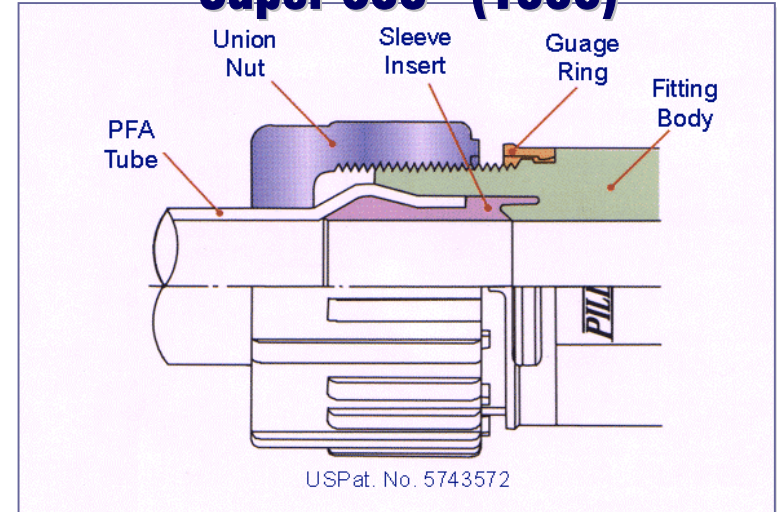
“Super Type” (1991)



- ✓ The original 3-piece, high-seal design.
- ✓ Tightly ‘sandwiches’ tube ends between body and sleeve, creating industry-leading mechanical & thermal stress tolerance.
- ✓ Uses primarily axial nut torque – like all prior fitting designs – for seal integrity.
- ✓ High sleeve strength decreases leading-edge deflection into flow path associated with high torque fittings.
- ✓ Large installed base. ~ 65% share in Asia



“Super 300” (1998)



- ✓ Retains all the mechanical & thermal stress tolerance of “Super Type”, while providing an even cleaner flow-path for modern ultra-fine particle process chemistries.
- ✓ Uses 360° radial sealing forces (NOT axial nut torque) to create primary tube seal. Nut need NOT be driven hard at fitting to create a seal.
- ✓ Low nut torque req. prevents the distortion and voids associated w/high torque fittings.
- ✓ Unique, integrated gauge-ring insures reliable seal. Tube installations are simple, consistent.
- ✓ Now adopted by the world’s leading OEMs.