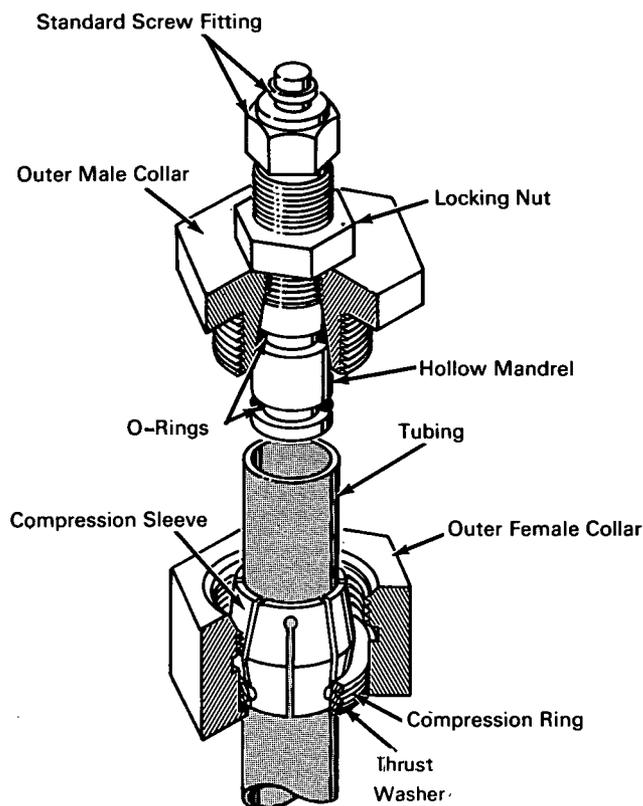


NASA TECH BRIEF



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High Pressure Tube Coupling Requires No Threads or Flares



The problem:

To design a tube coupling that will connect to any straight, unthreaded, and unflared tubing end without deforming or damaging the tubing.

The solution:

A high pressure coupling that grips the tube wall tightly between an external compression sleeve and

an internal hollow mandrel. The coupling is adaptable to standard screw fittings for test stand attachment.

How it's done:

The mandrel portion of the plug is inserted in the tubing with two O-rings installed. The outer female collar, thrust washer, and compression ring are then

(continued overleaf)

placed over the tubing. The tapered and slotted compression sleeve is then slid onto the tubing, with its forward taper fitting inside the compression ring taper, and the tube end flush with the rear portion of the sleeve. The outer male collar is threaded onto the portion of the hollow mandrel extending from the tube and into the female threads of the outer female collar.

As the male collar advances into the female collar, its internal taper forces the compression sleeve to deform because of the longitudinal slots in the sleeve. The resultant compressive radial force on the tube outer wall, supported from within the tube by the hollow mandrel, causes the tube to be gripped firmly by the coupling.

A locking nut is then threaded onto the plug and the test stand adapter or connector is attached. Pressure is transmitted from the test apparatus to the tubing through the hollow mandrel.

Notes:

1. The working pressure for the coupling is 180 psig for gas, and 1745 psi hydrostatic, at room temperature. These working limits should not be exceeded outside an approved safety cell.
2. Inquiries concerning this innovation may be directed to:

Technology Utilization Officer
Manned Spacecraft Center
Houston, Texas 77058
Reference: B66-10285

Patent status:

No patent action is contemplated by NASA.

Source: John A. Stein
of North American Aviation, Inc.
under contract to
Manned Spacecraft Center
(MSC-600)