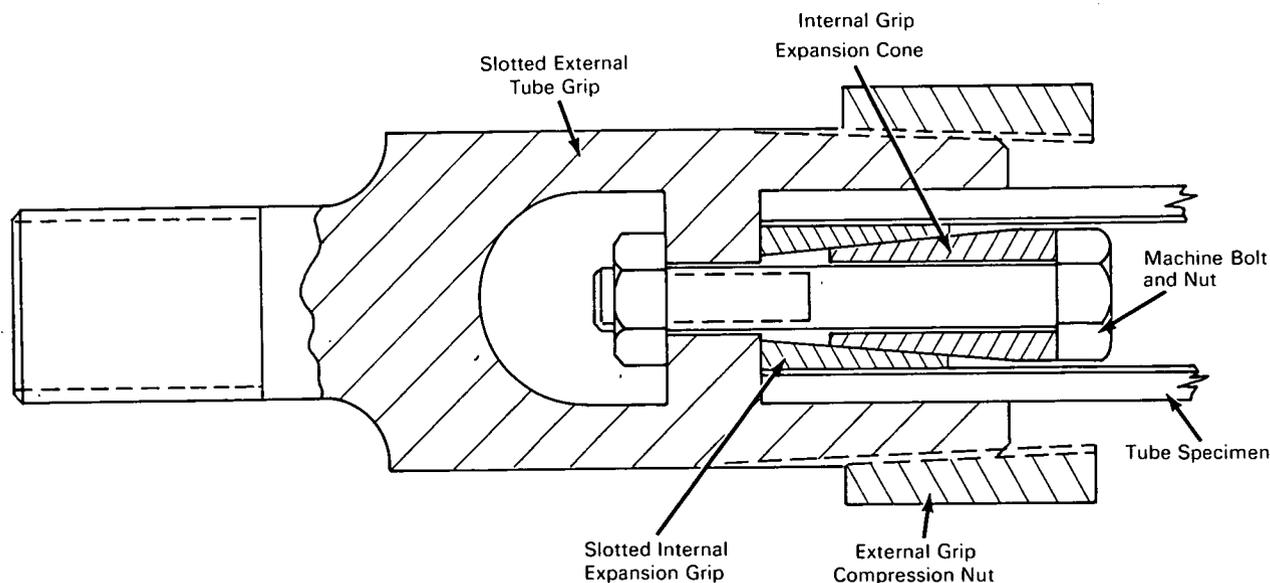


# NASA TECH BRIEF



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## Tensile Testing Grips Ensure Uniform Loading of Bimetal Tubing Specimens



Standard grips used in tensile testing of bimetal tubing specimens often allow the tensile loading to be applied directly only to the outer tube of a bimetal tubing specimen. With such grips, stresses are not distributed uniformly to the inner and outer tubes unless there is a strong bond between the tubes. Poor distribution of stresses would be likely when a bimetal tube is tested at high temperatures and the outer tube expands more than the inner tube.

The load distribution problem can be overcome by using tensile testing grips of the design shown in the illustration. Each grip is comprised of (1) a slotted internal expansion grip; (2) an internal grip expansion cone; (3) a standard machine bolt and nut; (4) an external grip compression nut with pipe threads; and (5) a slotted external tube grip with pipe threads at one end and an adapter for attachment to the tensile test

machine at the opposite end.

A grip is applied by fitting it to one end of the tube specimen as shown in the illustration. The nut on the machine bolt is tightened to expand the internal tube grip. The external compression nut is then tightened to compress the external grip against the outer surface of the tube specimen. The nut tightening procedure is repeated until the tube specimen is uniformly gripped internally and externally for testing. Upon completion of the test, the external compression nut is loosened to release the outer grip, and the internal nut on the bolt is then loosened to allow the internal grip to contract so that the tube specimen can be slipped free.

### Notes:

1. This tensile testing grip can be used on single-metal as well as bimetal tubes.

(continued overleaf)

2. The grip can be made to accommodate a range of tube diameters.

3. Details may be obtained from:  
Technology Utilization Officer  
Lewis Research Center  
21000 Brookpark Road  
Cleveland, Ohio 44135  
Reference: B68-10248

**Patent status:**

No patent action is contemplated by NASA.

Source: V. Hunt and S. D. Driscoll  
of Aerojet-General Corporation  
under contract to  
Lewis Research Center  
(LEW-10267)