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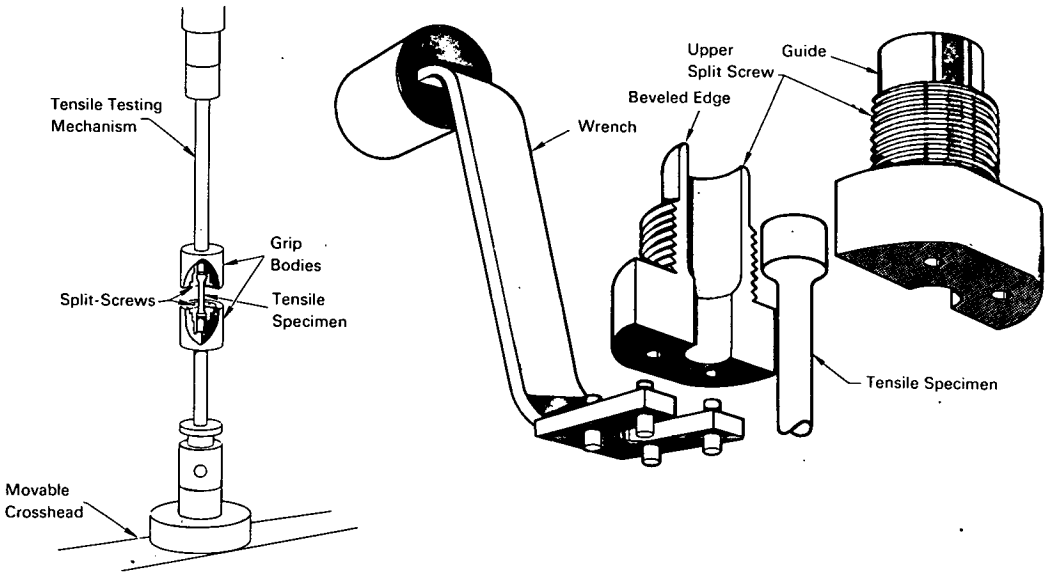
Tensile Testing Grips Are Easily Assembled under Liquid Nitrogen



The problem:

To design a specimen gripping device for tensile testing that provides uniform loading on the specimen shoulders. The device must be easily assembled under liquid nitrogen (LN_2), should minimize misalignment effects, and afford positive sealing to the specimen.

The solution:

Split-screw grips featuring: (1) holes in the split-screw heads such that when matched to corresponding pins on a special wrench, the screws and specimen can be threaded as an assembly into a grip body; (2) closely controlled guides and seats which afford positive seating; and (3) precision machining of mating surfaces to minimize misalignment effects.

How it's done:

The split-screw grips were developed for testing specimens of beryllium irradiated at 140°R. At the beginning of the test procedure, the specimen and split-screw grips are under LN_2. Tongs are used to place the two matching halves of the screw around the specimen and onto the pins of the wrench. This assembly is threaded into the top grip body; then the movable crosshead is run up so that the specimen is hanging into the bottom grip body. Another pair of split-screw grips is assembled around the specimen and threaded in with the opposite side of the wrench.

Positive location of the holes and pins eliminates mismatching of threads and subsequent jamming. The split design offers uniform loading around the entire

(continued overleaf)

shoulder of the specimen. The guide and seats provide controlled surfaces so that no contribution to misalignment is made and correct seating of the specimen is positive and reproducible. Assembly under LN_2 is relatively fast and easy, and the operation does not necessarily require viewing to ensure a proper fit. The inside surface and edges of the wrench and the ends of the tongs are taped to prevent scratching the specimen. The wrench handle is insulated to protect the hands.

Note:

Inquiries concerning this innovation may be directed to:

Technology Utilization Officer
AEC–NASA Space Nuclear Propulsion Office
U.S. Atomic Energy Commission
Washington, D.C. 20545
Reference: B67-10628

Patent status:

No patent action is contemplated by AEC or NASA.

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