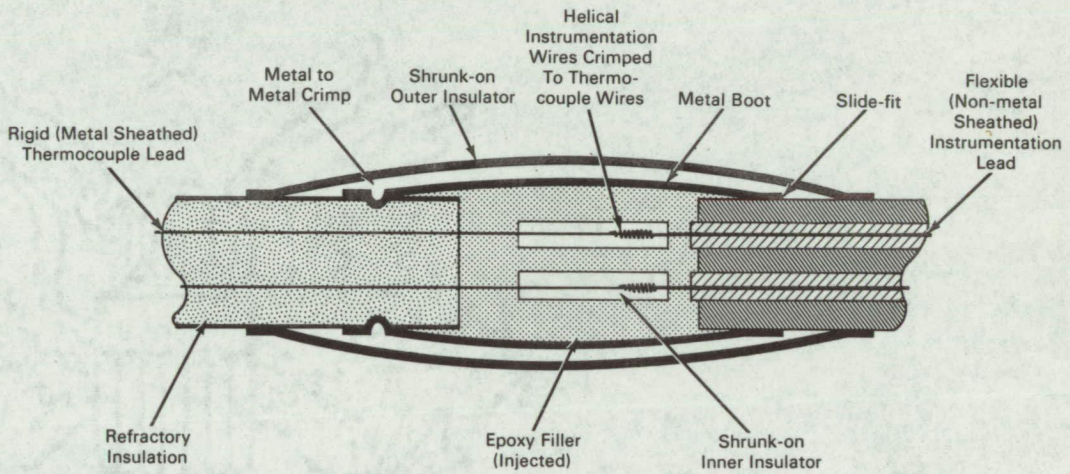
NASA TECH BRIEF

Thermocouple-to-Instrumentation Connector Features Quick Assembly



The problem: To quickly connect metal-sheathed thermocouple leads (consisting of thin, delicate wires encased in a brittle molybdenum sheath) to flexible (non-metal-sheathed) instrumentation leads. Previous methods required approximately one hour when practiced by skilled personnel.

The solution: A crimping and bridging process that replaces soldering and brazing and eliminates thermal and mechanical work-hardening of the thermocouple leads and sheath.

How it's done: A metal boot and a heat-shrinkable outer insulator are slipped over the instrumentation leads, and both thermocouple and instrumentation leads are stripped of their insulation. Heat-shrinkable inner insulators are slipped over the instrumentation leads and the stripped portions are formed into helix coils with a simple hand tool. These helix coils are slipped over the stripped thermocouple leads and crimped to form an effective connection. The inner insulators are then slipped over the connections and shrunk on. Following this, the metal boot is moved into place and crimped to the metal sheath of the thermocouple leads, thus forming a bridge. Epoxy filler is injected into the cavity formed by the bridge, lending a stiffness to the joint and forming a moisture proof and corrosion proof seal. The outer insulator is then positioned over the joint assembly and shrunk on.

(continued overleaf)

Notes:

1. This connection is a minimum diameter joint that eliminates the requirement for expensive special transition sections.
2. High quality connections can be fabricated by semiskilled personnel in about five minutes per joint.
3. A related innovation is described in NASA Tech Brief B63-10529, April 1964. Inquiries may also be directed to:

   Technology Utilization Officer
   AEC-NASA Space Nuclear Propulsion Office
   U.S. Atomic Energy Commission
   Washington, D.C., 20545
   Reference: B65-10246

Patent status: NASA encourages commercial use of this innovation. No patent action is contemplated.

Source: E. Henshaw of
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