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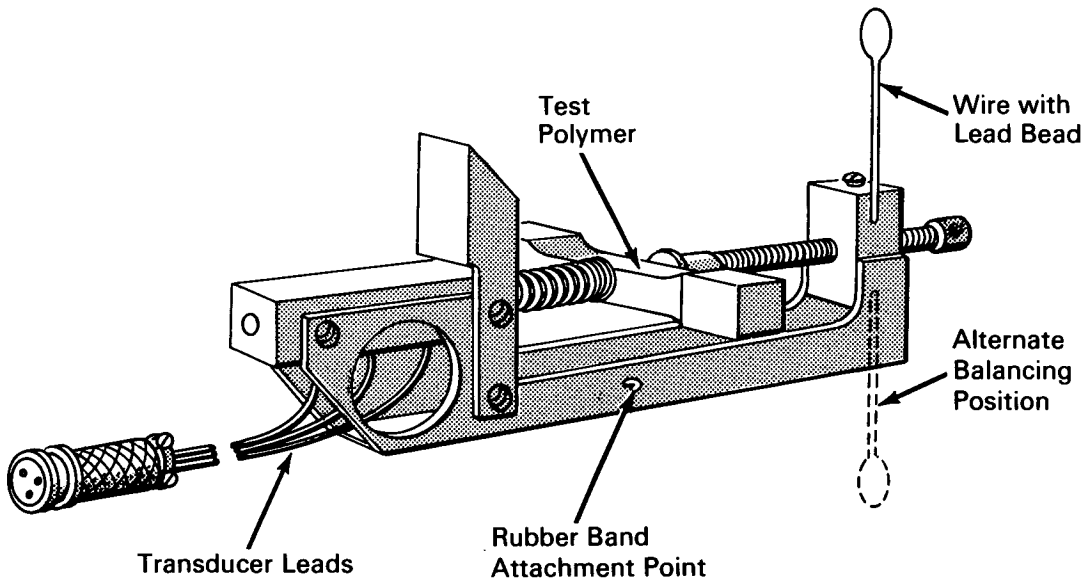
NASA TECH BRIEF

Polymer Deformation Gauge Measures Thickness Change in Tensile Tests



The problem:

To determine the thickness (or cross-sectional) changes undergone by a polymer specimen during the testing of its tensile and elongation properties.

The solution:

A lightweight deformation gauge that remains attached to the specimen throughout testing. This allows continuous measurement of thickness changes with minimum effect on the test specimen.

How it's done:

The gauge body mounts an adjustable screw and a spring-loaded feeler that lightly engage the test specimen. The gauge is suspended from the sample, but because of its light weight, only minimum contact pressure is exerted on the specimen. A transducer attached to the spring-loaded feeler converts any change in specimen cross section into an electrical signal that registers on readout instrumentation. The gauge is finely balanced about the neutral centerline of the test specimen by means of a wire with a lead bead on one end. The wire with lead bead is inserted into a tight hole at one end of the gauge after correct wire length for perfect balance has been determined by trial and error.

If it is desired to measure the thickness of a moving test specimen, a rubberband from the gauge body to a moving platform is used to balance the assembly. The wire with lead bead is placed in the alternate position, shifting the balance point to the center of the rubberband attachment point. In this mode, and suspended from a platform mechanically driven to coincide with

(continued overleaf)

the moving sample, the test specimen is influenced only by the light spring forces needed to overcome the sliding friction of the transducer.

Notes:

1. Mechanical noise from outside sources is dampened when the assembly is hung on a light rubberband.
2. Inquiries concerning this invention may be directed to:

   Technology Utilization Officer
   Jet Propulsion Laboratory
   4800 Oak Grove Drive
   Pasadena, California, 91103
   Reference: B66-10147

Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C., 20546.

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