

NASA TECH BRIEF

Langley Research Center



NASA Tech Briefs announce new technology derived from the U.S. space program. They are issued to encourage commercial application. Tech Briefs are available on a subscription basis from the National Technical Information Service, Springfield, Virginia 22151. Requests for individual copies or questions relating to the Tech Brief program may be directed to the Technology Utilization Office, NASA, Code KT, Washington, D.C. 20546.

Fatigue Testing Device

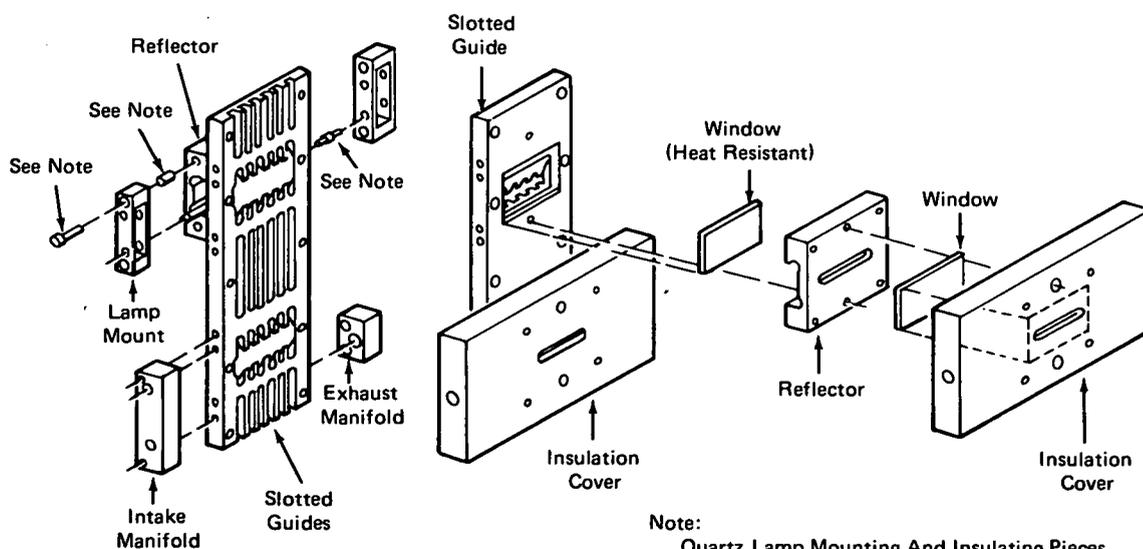
An anti-buckling assembly has been developed which prevents buckling of a sheet metal fatigue specimen when axial compressive load is applied; it has provisions for cyclic heating and cooling of the specimen during testing; it permits simultaneous tests at two locations on the specimen; and has ports for visual, optical, or photographic monitoring of fatigue crack propagation in the test specimen.

The main components of the assembly (see illustration) are the slotted guides. The slotted guides are used in pairs and are placed over the test specimen with the slotted sides of the guides facing the specimen as it is mounted in the fatigue machine. Shims are inserted between the guides in such a manner that neither the shims nor guides interfere with the test specimen. With the guides in this position they assure that the specimen does not buckle when compressive loads are applied. The guides contain passages for the movement of air to cool the specimen, a mounting for a heat source to heat the specimen, and ports for viewing fatigue cracks.

Reflectors, upon which are mounted quartz-envelope heating lamps, reflect radiant energy to the test specimen through the viewing ports in the guides. The viewing ports in the guides are covered with a heat resistant window which prevents air from circulating and disrupting the temperature uniformity of the specimen.

The test specimen is cooled by pressurized air through one end of the intake manifold and the channels in the guides. A special fitting assures that the air supply to each of the test areas is equal. The heated air is expelled through another port in the intake manifold and through the exhaust manifold.

Similar assemblies may be designed to accommodate specimens with other than two test sections and of different shapes. Cooling at different rates may be achieved by using media other than compressed air. Heating rates are dependent on the type of controller used [in this device temperature may be cycled from room temperature to 588 K (600° F) to room temperature in less than one minute].



(continued overleaf)

Note:

No additional documentation is available. Specific questions, however, may be directed to:

Technology Utilization Officer
Langley Research Center
Mail Stop 139 A
Hampton, Virginia 23365
Reference: B73-10047

Patent status:

Inquiries concerning rights for the commercial use of this invention should be addressed to:

Patent Counsel
Langley Research Center
Code 456
Hampton, Virginia 23365

Source: F. E. Eichenbrenner and L. A. Imig
Langley Research Center
(LAR-10426)