

# NASA TECH BRIEF



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 Clearinghouse for Federal Scientific and Technical Information, Springfield, Virginia 22151. Requests for individual copies or questions relating to the Tech Brief program may be directed to the Technology Utilization Division, NASA, Code UT, Washington, D.C. 20546.

## Bonding of Strain Gages to Fiber Reinforced Composite Plastic Materials

Conventionally, strain gages are bonded to fiber reinforced composite plastic materials by adhesives which often have limited thermal stability. After the object has been fabricated, a prepared area on its surface is precoated with an adhesive. The strain gage is installed and the adhesive is cured by heat and pressure to attach the strain gage to the object securely. This method requires considerable time for highly skilled technicians.

A process has recently been developed for installing strain gages during fabrication of the fiber reinforced composite. The strain gage is installed during the molding of the composite and utilizes the adhesive properties of the matrix resin in the composite to bond the strain gage in place. Thus, the gage can be installed either on or under the surface. This technique can be used to install strain gages on any composite, plastic or adhesive joint in which the resinous component can be used at an intermediate cure stage.

The advantages of this method include: (1) considerable time saving in installation of strain gages; (2) the strain gage becomes an integral part of the

composite rather than depending upon secondary bonding; (3) elimination of a separate adhesive; and (4) the high-temperature-resistant matrix resin of the composite serves as the bonding agent. When strain gages are embedded in the matrix resin, they provide data at all temperatures that the matrix can withstand.

### Note:

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

Technology Utilization Officer  
Lewis Research Center  
21000 Brookpark Road  
Cleveland, Ohio 44135  
Reference: B70-10630

### Patent status:

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

Source: T. T. Serafini, M. P. Hanson and  
C. C. Chamis  
Lewis Research Center  
(LEW-11151)

Category 01,04