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NASA TECH BRIEF



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Compound Improves Thermal Interface Between Thermocouple and Sensed Surface

The problem:

Attachment of thermocouples to brittle materials that cannot be welded is extremely difficult. Commercially available epoxy resin cements have been developed that permit gluing of the thermocouples into position, but these tend to form thermal barriers at cryogenic temperatures.

The solution:

A mixture of the epoxy resin cement with a conducting material to effect a metal-to-metal contact without sacrifice of adhesive quality.

How it's done:

A formulation of 65% epoxy resin cement and 35% commercially available silver powder gives an adhesive mixture that bonds well and doubles the thermal conductivity available at cryogenic temperatures using the epoxy resin cement alone.

Notes:

1. In one application, 40-mil holes were drilled in beryllium and thermocouples coated with this compound were inserted. The thermocouples performed well at liquid hydrogen temperature.

2. This mixture is of direct interest to the broad field of cryogenics. It may find special application in the field of superconductivity.
3. 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
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Patent status:

No patent action is contemplated by NASA.

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