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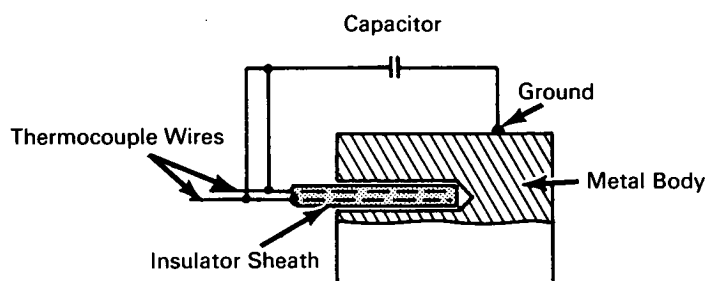
Brief 66-10653

NASA TECH BRIEF



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Thermocouples Easily Installed in Hard-To-Get-To Places



The problem:

To devise a method for installing thermocouple wires in places that are not accessible to hand-welding techniques. Previous methods, such as potting the thermocouple in a drilled hole, proved unsatisfactory because of uncertain contact.

The solution:

Thermocouple wires attached to charged capacitors are inserted in a drilled hole. An electric charge fuses the thermocouple wires to the host material.

How it's done:

A sufficiently large hole to accommodate the thermocouple wires and insulating sheath is drilled in the host material. The thermocouple wires are stripped, twisted together, and made to form a junction by using a mercury arc fusion welder. A bank of capacitors (or a percussion welding machine) is then attached to the thermocouple, with one side to the wires and the other grounded to the host material. The capacitors are then charged and the thermocouple is inserted in the drilled hole. An insulating sheath is used to prevent the thermocouple junction from touching the sides. The capacitors are discharged, forming an arc and causing the thermocouple wires to be fused to

the host material, thereby eliminating any air gap between the thermocouple and the host material.

Notes:

1. This method has shown excellent results in fusing nichrome, chromel, Inconel, and stainless steel wires to nickel, beryllium, iron, steel, Inconel, and stainless steel.
2. Aluminum and copper can also be fused but not with a high degree of reliability.
3. Inquiries concerning this invention may be directed to:

Technology Utilization Officer
Marshall Space Flight Center
Huntsville, Alabama 35812
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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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Category 01