NASA TECH BRIEF

Ames Research Center

Flexible Temperature Probe for Biological Systems

The problem:

To construct a small probe for sensing rectal temperature in human subjects; the probe must be sufficiently flexible so that it can be worn comfortably for long periods of time, but relatively rigid to permit easy insertion.

The solution:

Imbed the body and electrical leads of a small thermistor in a flexible fluorosilicone matrix contained in vinyl plastic tubing.

How it's done:

The electrical leads of a small thermistor are cut at staggered lengths, the longest at 25.4 mm, and then soldered to polytetrafluoroethylene-coated wire (29 AWG, 51 strands) of appropriate length. The wires are twist-braided and inserted into a long sheath made of fluorosilicone rubber tubing (1.6-mm I. D. x 2.4-mm O. D.) up to the thermistor tip. To strengthen the cable while maintaining flexibility, the tubing is filled with liquid fluorosilicone rubber and allowed to cure for 24 hours; interconnected ties made with surgical silk above and below the solder joints act as a strain relief. The thermistor, leads, solder joints, and part of the cable are inserted into a 50-mm length of vinyl plastic sleeve so that the sensitive end of the thermistor extends about 1.6 mm beyond the sleeve. Finally, the exposed thermistor, sleeve, and part of the attached cable assembly is encapsulated for a length of about 125 mm by dipping it in a white, room-temperature-vulcanizable silicone rubber composition that has been diluted with a light solvent so that thin coatings can be applied. The encapsulant is allowed to dry somewhat; then another coat is applied and allowed to cure for 24 hours prior to use.

Note:

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

Technology Utilization Officer
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Moffett Field, California 94035
Reference: B73-10498

Patent status:

NASA has decided not to apply for a patent.

Source: Peter J. Haro and Charles Winget
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