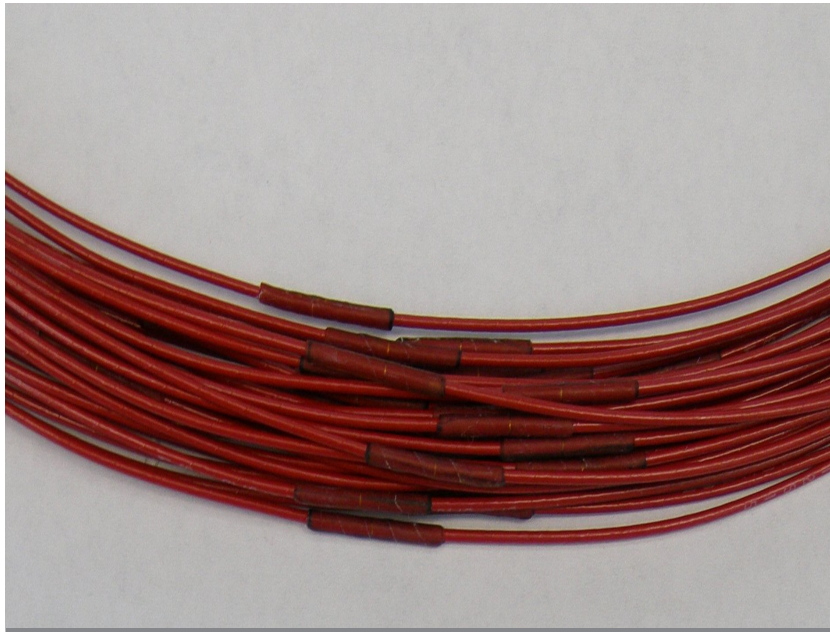




TECHNOLOGY SOLUTION

Materials and Coatings



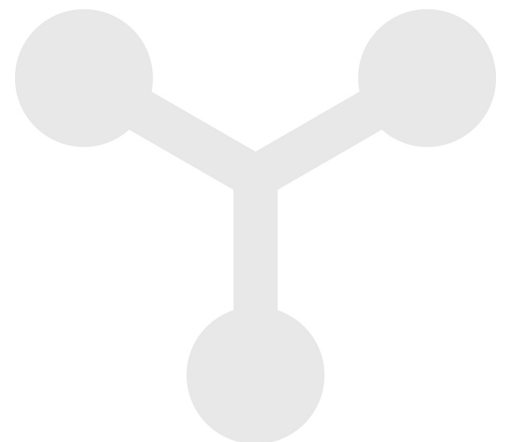
Polyimide Wire Insulation Repair System

Permanent, flexible, and less intrusive wire repair systems

NASA Kennedy Space Center seeks partners interested in the commercial application of its Polyimide Wire Insulation Repair System. This technology is a kit, consisting of thin film polyimide patches that are applied to damaged areas of wire insulation with a heating device that adheres the polyimide repair film into place. The technology has been prototyped and successfully tested by NASA and the Naval Air Systems Command (NAVAIR). Wire repairs made with this system are permanent, flexible, and much less intrusive than repairs made using current techniques and materials. The technology is well suited for all applications of polyimide and other high-performance polymer-jacketed wire constructions.

BENEFITS

- High performance Repairs comply with industry standards for tensile strength, electrical resistivity, voltage breakdown, solvent resistance, and flammability
- Flexibility Repairs are more flexible and less bulky than repairs using existing techniques
- Airtight - Technology provides a hermetic repair
- Durability Repairs are permanent
- Adhesion Unique adhesive properties provide superior bonding to damaged surface
- Adaptability Materials and techniques can be used on larger-gauge wiring and flat-ribbon wire harnesses



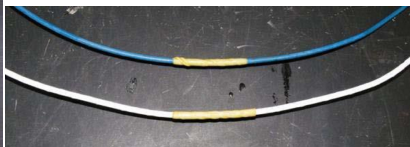
THE TECHNOLOGY

A major limitation of current aerospace wire insulation is that it tends to crack and fray as it ages and is easily damaged. Generally, it is more cost-effective to repair wire insulation than to replace a section of the wire (or bundle) itself. Current repair methods include a tape wrap repair and a heat shrink repair. These methods have a number of drawbacks: susceptibility to vibration, fluid intrusion, and other mechanical stresses. The repair patch/material can loosen or separate, exposing the bare metal conductor or opening the polyimide insulation to more damage at the interface.

The technology developed by KSC is a flexible polyimide film patch (either wrap or sleeve) that is heated with a custom heating tool to melt, flow, and cure the film. The new technology results in hermetically sealed, permanent repairs that are much more flexible and less intrusive than repairs made using current practices. The repair remains flexible after application, has no limit in length or bend radius, and retains the high-temperature exposure of the original polyimide insulation. Extensive testing by NASA and NAVAIR has demonstrated that these repairs comply with industry standards for tensile strength, electrical resistivity, voltage breakdown, solvent resistance, and flammability. This system is adaptable and may also be used on larger-gauge wiring, as well as flat-ribbon wire harnesses and twisted shielded wires.



Wire Repair Heating Tools



Repaired Wires

APPLICATIONS

The technology has several potential applications:

- Aerospace Wiring
- Automotive Wiring
- Marine Wiring
- Industrial Wiring

PUBLICATIONS

Patent No: 8,623,253; 9,365,756; 9,193,830

Patent Pending