



**WINNER**

## **1999 R&D 100 Awards Winner**

### **Real-Time, Puncture-Detecting, Self-Healing Materials**

#### **Features**

Our real-time, puncture-detecting, self-healing materials, called INSTALARM Materials, provide instant electrical detection of punctures in personal protective clothing, storage containers, and related hazardous-materials applications. The materials are compatible with audible, visual, or computer alarm systems, and are flexible enough to be configured for almost any application. A unique layered construction allows INSTALARM Materials gloves or suits to trigger an alarm when two conductive layers, sandwiched within the material, are brought into contact with one another by any piercing object. In addition, the conducting layers are of a "gooey" substance that can reclose over certain breaches, making the material self-healing for many applications.

#### **Applications**

INSTALARM Materials can be used for puncture detection in

- personal protective equipment—gloves, garments, biohazard suits, masks;
- containers—storage containers (for chemicals, biohazards, radionuclides), disposal bags, natural gas lines, and oil pipelines;
- environmental containment—geomembranes (hazardous-waste sites/landfills, and petroleum-storage areas); and
- many other places where it would be good to know if and when a breach has occurred.

#### **Benefits**

INSTALARM Materials could save lives by instantaneously warning of material punctures, thereby minimizing workers' exposure to chemicals, biohazards, and radioactive contamination. They will also save time by eliminating the need for time-consuming glove-testing procedures, increase workers' confidence in their ability to safely perform hazardous tasks within critical time periods, and allow immediate implementation of emergency procedures in the event of a breach.