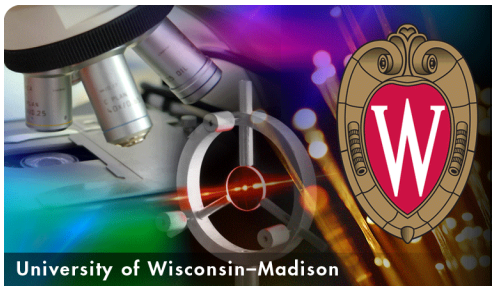
Solid-State Strain Sensor That Can Sense Shear and Normal Deformation in Almost Any Dielectric Material



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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a novel class of strain sensors.

OVERVIEW

Strain sensors are useful in a wide variety of applications, including robotics, biomedical devices, fluid flow sensing and vibration dampening. Existing strain sensors -- such as piezoelectric, piezoresistant wire, and strain-induced, bi-refringence sensors -- tend to be expensive, limited to single applications or use with certain materials, and require close contact between the sensor and the material being measured.

THE INVENTION

A UW-Madison engineer has now developed a novel class of strain sensors that can sense shear and normal deformation in nearly any dielectric material, without the need for mechanical contact. These new strain sensors are based on electrostriction, a phenomenon in which a material's dielectric properties change with deformation.

The sensor is a solid-state, single-plate device in which pairs of electrodes are positioned in close proximity to the material being measured. As the material deforms and its electrostrictive properties change, this alteration registers as a change in capacitance between paired electrodes. The strain force in the material is then determined by calculating the material's change in electrostrictive parameters from the change in capacitance.

APPLICATIONS

- Flexibility allows design of embedded sensors for on-line monitoring devices, biologically inert sensors for biomedical applications, and sensors for controlling liquid and melt flows

KEY BENEFITS

THE WARF ADVANTAGE

Since its founding in 1925 as the patenting and licensing organization for the University of Wisconsin-Madison, WARF has been working with business and industry to transform university research into products that benefit society. WARF intellectual property managers and licensing staff members are leaders in the field of university-based technology transfer. They are familiar with the intricacies of patenting, have worked with researchers in relevant disciplines, understand industries and markets, and have negotiated innovative licensing strategies to meet the individual needs of business clients.

- Simple and inexpensive to manufacture
- Suited to mass production as both stand-alone sensors and sensor arrays
- Scalable for use in both microscale and macroscale devices
- Flexible -- able to sense strain in nearly any type of material, including organic polymers, resins, paint, clays, food stuffs and biological materials
- Extremely robust -- demonstrated tolerance to overloads of up to six orders of magnitude, making it well-suited to tactile sensing in robotics

ADDITIONAL INFORMATION

Tech Fields

Analytical Instrumentation - Sensors
Engineering - Testing

CONTACT INFORMATION

For current licensing status, please contact Mark Staudt at mstaudt@warf.org or 608-960-9845.