

Category: Sensors & Measurement Techniques

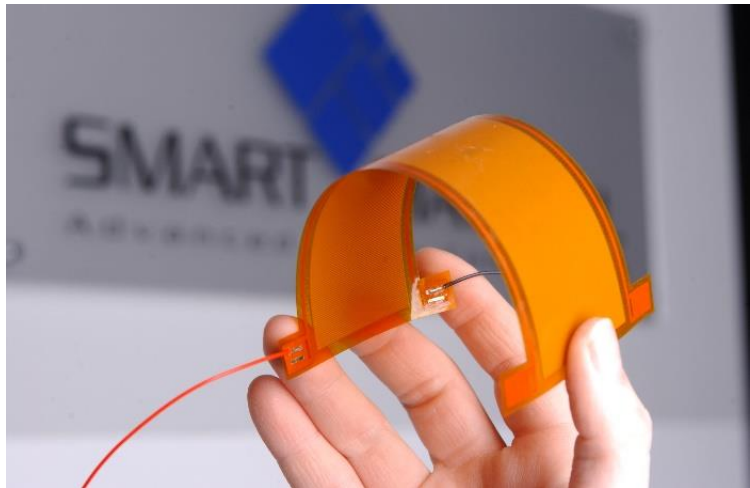
Reference: TD-DE-1039

MFC – Macro Fiber Composite Actuator and Sensor

The Macro Fiber Composite (MFC) is an innovative actuator that offers high performance and flexibility in a cost-competitive device and was originally developed at NASA's Langley Research Center for aerospace applications.

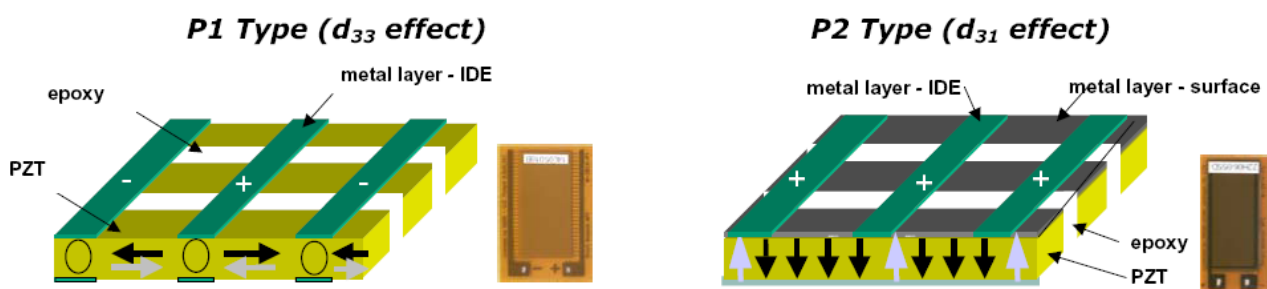
The MFC consists of rectangular piezo-fibers sandwiched between layers of adhesive, electrodes and polyimide film.

The MFC technology permits the production of perfectly aligned fiber actuators that are no thicker than a few tenths of a millimeter.



This film contains interdigitated electrodes that transfer the applied voltage directly to and from the ribbon shaped rods. This assembly enables in-plane poling, actuation, and sensing in a sealed, durable, ready-to-use package. When embedded in a surface or attached to flexible structures, the MFC provides distributed solid-state deflection and vibration control or strain measurements. A further field of application is the Energy Harvesting where environmental "waste" vibrations are being used for powering of small electronics like sensors or telemetric data transmission systems.

The MFC is available in d_{33} and d_{31} operational mode, a unique feature of the Macro Fiber Composite. Furthermore beside of the MFC's in standard sizes available from stock customized layouts and sizes are possible within 3-4 weeks leading time.



Innovative Aspects:

The MFC feature the following innovative characteristics:

- Flexible and durable
- Increased strain actuator efficiency
- Directional actuation/sensing
- Damage tolerant
- Available as elongator (d_{33} mode) and contractor (d_{31} mode)
- Conforms to surfaces
- Readily embeddable
- Environmentally sealed package
- Demonstrated performance
- Different piezo ceramic materials available

Application Areas:

Applications for the MFC range from vibration reduction to shape-changing structures, from micropositioning to dynamic structural health monitoring or force-sensor applications. Applications are, e.g.:

- Vibration and noise control
- Structural forming, morphing
- Structural health monitoring
- Strain gauges
- Loudspeaker applications
- Energy harvesting

Cooperation:

The technology provider is interested in sale of the MFC, on customer-specific development and on adaptation the MFC on customers applications.