



## Bistable Electroactive Polymers

Tech ID: 22319 / UC Case 2009-356-0

### SUMMARY

A bistable electroactive polymer transducer is provided for electrically actuated deformation of rigid electroactive polymer members. The polymers have glass transition temperatures (Tg) above ambient conditions and turn into rubbery elastomers above Tg and have high dielectric breakdown strength in the rubbery state. They can be electrically deformed to various rigid shapes with maximum strain greater than 100% and as high as 400%. The actuation is made bistable by cooling below Tg to preserve the deformation. The dielectric actuation mechanism includes a pair of compliant electrodes in contact with a dielectric elastomer which deforms when a voltage bias is applied between the pair of electrodes. In some of the transducers of the present invention, the dielectric elastomer is also a shape memory polymer. The deformations of such bistable electroactive polymers can be repeated rapidly for numerous cycles. The polymer transducers have such advantages as high energy and power densities, quietness, mechanical compliancy (for shock resistance and impedance matching), high efficiency, lightweight, and low cost.

### PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	8,237,324	08/07/2012	2009-356

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### INVENTORS

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### OTHER INFORMATION

#### CATEGORIZED AS

- **Energy**
  - Other
- **Materials & Chemicals**
  - Polymers
- **Medical**
  - Devices

#### RELATED CASES

2009-356-0

### ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- [Electrocaloric Cooling With Electrostatic Actuation](#)
- [An Actuator Device Driven By Electrostatic Forces](#)
- [Bulk Polymer Composites](#)
- [A Phase-Changing Polymer Film for Broadband Smart Windows Applications](#)

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