



1, 2 *Polymeric ultrasonic transducer.*
3 *Piezoelectric touch sensor.*

SENSORS AND ACTUATORS

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Fraunhofer IAP provides research on and development of functional materials and devices for different sensor and actuator purposes. The main application fields are material development, processing and characterization as well as embedding of electroactive polymers (EAP) in electromechanical transducers which work in the piezoelectric or electrostrictive sensor or actuator modes. As piezoelectric materials, classical ferroelectric polymers, polymer-ceramic composites, and newly developed cellular polymer foams (so-called ferroelectrets) are investigated and adapted for different applications such as structured large-area sensors, touch pads, and ultrasonic sensors and actuators.

As electroactive materials, so-called dielectric elastomer actuators (DEA) are developed. The electrically-controllable large-strain actuation of DEAs is used in artificial muscles and in miniaturized actuators for optical systems. Beside the activities in the field of electromechanical materials,

Fraunhofer IAP also performs material research and transducer development for other sensor purposes such as capacitive, humidity, and magnetic-field sensors.

Basic aspects of the research are material development and composition optimization, evaluation of underlying structure-property relations and process-technique development for transducer materials and contact layers. Here, new techniques such as ink jet printing, air brush and slot-die coating are adapted and used in addition to classical spin coating and solvent casting.