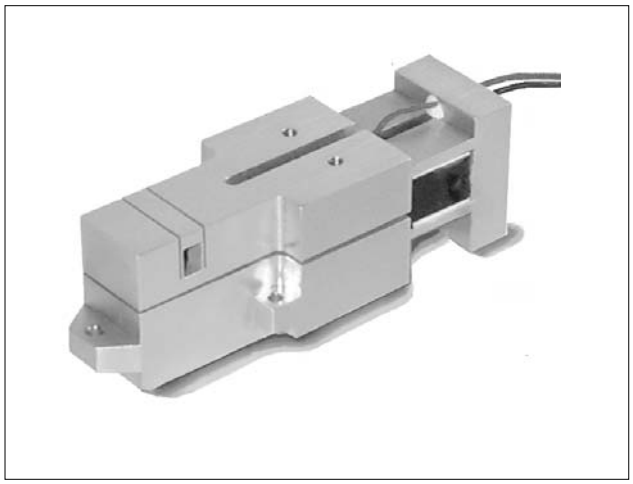
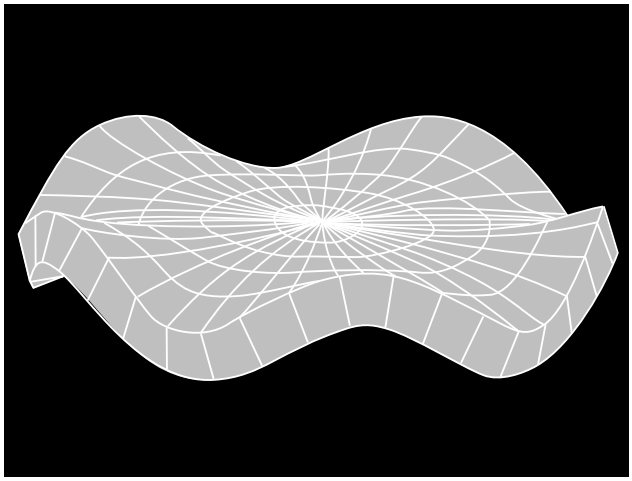
PIEZO SYSTEMS, INC.
65 Tower Office Park Woburn, MA 01801 • Tel: (781) 933-4850 • Fax: (781) 933-4743 • Web: www.piezo.com • E-mail: sales@piezo.com

OEM COMPONENT DEVELOPMENT

HIGH FREQUENCY TUNING FORK



HIGH OUTPUT ACTUATOR



FEA MODELING

CUSTOMER SPECIFICATIONS

Piezoceramic actuator design is based on customer specifications which include as a minimum:

- Motion and force requirements
- Space available
- Voltage available
- Thermal operating range
- Frequency operating range or response time

Dynamic sensor design is based on customer specifications which include as a minimum:

- Voltage and current requirements
- Space available
- Force or strain available
- Thermal operating range
- Frequency range or transient response time

ACTUATOR & SYSTEM DESIGN

Using extensive computer software and experience, Piezo Systems can move quickly from your specifications to a complete optimized design and prototype. The geometry, electroactive material, internal lamination, polarization, electrode configuration, mount, power take-off, and production process is designed to ensure repeatable and reliable performance.

Piezo Systems can also design and build the electronic system to drive or monitor the transducer, and fabricate (or mold) the structure to which the piezo is mounted.

OEM PRODUCT DEVELOPMENT

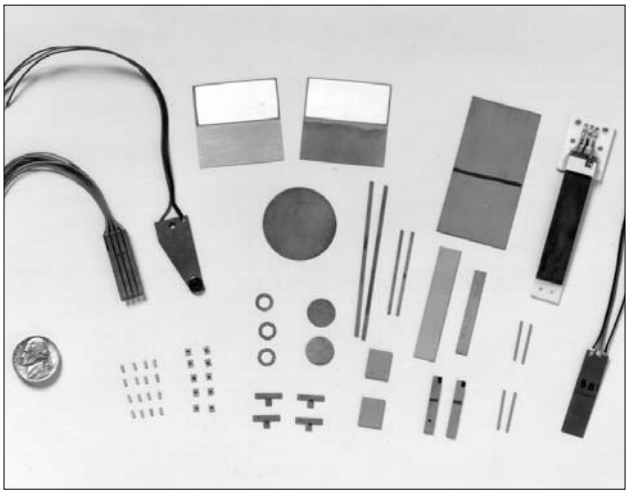
Piezo Systems Inc. offers engineering services for custom OEM component development. Our experience allows the elimination of potential design flaws which plague those unfamiliar with piezoceramic technology, especially in the areas of lamination bonding, flexure design, ceramic stress and fatigue criteria, thermal stability, mounting, power take-off attachments, electronic drive, testing, and evaluation. This service reduces the customer's need to dedicate highly qualified personnel during the development period, and development time is typically reduced from years to months. Financial and technical risks are minimized. The following phases are quoted on a fixed price basis:

- Analysis and Design Phase: Communication of specifications, analysis, and optimized design of transducer.
- Prototype Phase: Samples built to specification.
- Pre-production Phase: Pre-production samples for exhaustive testing.
- Production Phase: Production pieces at desired volume.

AREAS OF EXPERTISE

BENDING ACTUATORS & SENSORS

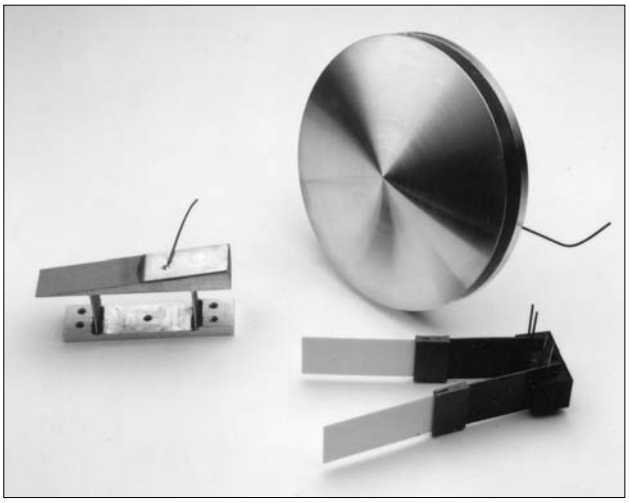
Piezo Systems specializes in manufacturing bending elements. A proprietary bonding process and ceramic qualifying program leads to consistent performance, high-strength, thermally stable, void free, multilayer laminations. Advanced cutting techniques produce actuators with dimensional tolerances within ±.001 inch if necessary; chip free edges; non-linear shapes; and contamination free surfaces. Piezo Systems ships parts to performance specifications, not merely to dimensional tolerance. Our bending actuators are employed in piezo valves, choppers, modulators, fans, tunneling microscopes, and soil testers. Our bending sensors are used in implantable pacemakers and industrial equipment.



BENDING ELEMENTS

RESONANT DEVICES

Resonant devices are an effective way of achieving high periodic motion at low voltage and power. Products designed to operate at a single frequency require special attention be paid to dimensional uniformity, material consistency, and process control. A careful balance is sought between minimizing strain on the piezoceramic and maximizing the dynamic amplitude. Energy losses due to internal dissipation, external attachments, and output loading are addressed.

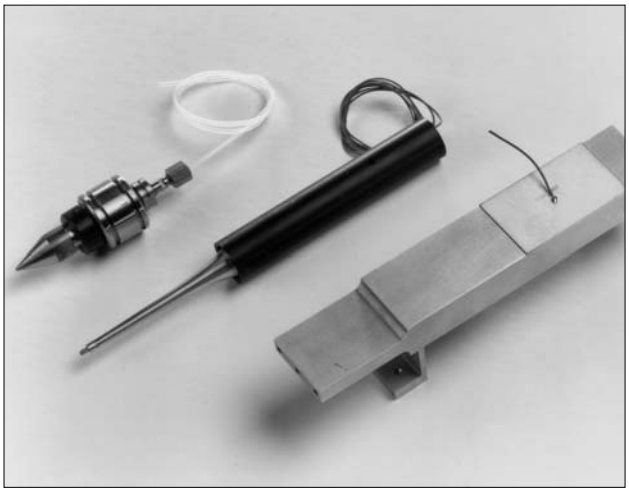


RESONATORS

ULTRASONIC DEVICES

Ultrasonics, a special portion of the resonant spectrum, find extensive use over a wide range of application areas. These devices are designed according to the same principles guiding resonant devices. However, additional consideration is given to amplitude stability, power consumption, over-heating, resonance tracking, and electronic drive.

Piezo Systems has developed a monolithic construction which eliminates many of the problems associated with precompressed bolt together systems.



ULTRASONICS

CONSULTING & ANALYSIS

Piezo Systems offers consultation on an hourly, daily, weekly, and monthly basis.

PRODUCTION

Combined with proprietary processing techniques, Piezo Systems works closely with a network of highly specialized vendors. As a result Piezo Systems is capable of supplying highly sophisticated single parts or hundreds of thousands of parts per year.