

Transducer Crystals



Boston Piezo-Optics specializes in the supply of custom and OEM specified piezoelectric transducer crystals.

We maintain an inventory of quartz, many of the popular piezoceramics, lithium niobate, tourmaline, and other special piezoelectric materials from which we fabricate crystals to meet your specific needs.

Crystals are available to generate or detect compressional, shear, torsional, length extensional or flexural modes of vibration.

[Contact us](#) to discuss your particular application.

Materials

- ◇ Single-Crystal Quartz
- ◇ Lead Zirconate Titanate
- ◇ Lithium Niobate
- ◇ Tourmaline
- ◇ Other special piezoelectric materials

Typical Applications

- ◇ Medical diagnostic and therapeutic applications
- ◇ Acoustic holography
- ◇ Non-destructive testing and evaluation
- ◇ Surface acoustic wave devices
- ◇ Ultrasonic delay lines
- ◇ Acousto-optical components
- ◇ Pressure measurement
- ◇ Property analysis of solids, liquids and gases

- ◇ Flow and level sensing
- ◇ Proximity Sensors
- ◇ Accelerometers
- ◇ Pressure Transducers Finishes

Application Assistance

The skills necessary to produce our transducer crystals are readily applied to the production of related acoustic items, such as wear plates and buffer rods. High quality lapping techniques and chemically applied overtone polish provide crystal quartz, fused silica and alumina components with minimal sub-surface damage.

Shapes

We routinely produce round, square, rectangular, triangular and wedged pieces. We also produce cones, tubes, cylinders, spherical and annular configurations.

Sizes

Crystals as large as 4" X 8" at 1 MHz in quartz, 6" in diameter in ceramics, and as small as 0.020" in diameter in both quartz and ceramics are available. Rectangular or square crystals can be made in similar sizes.

Finishes

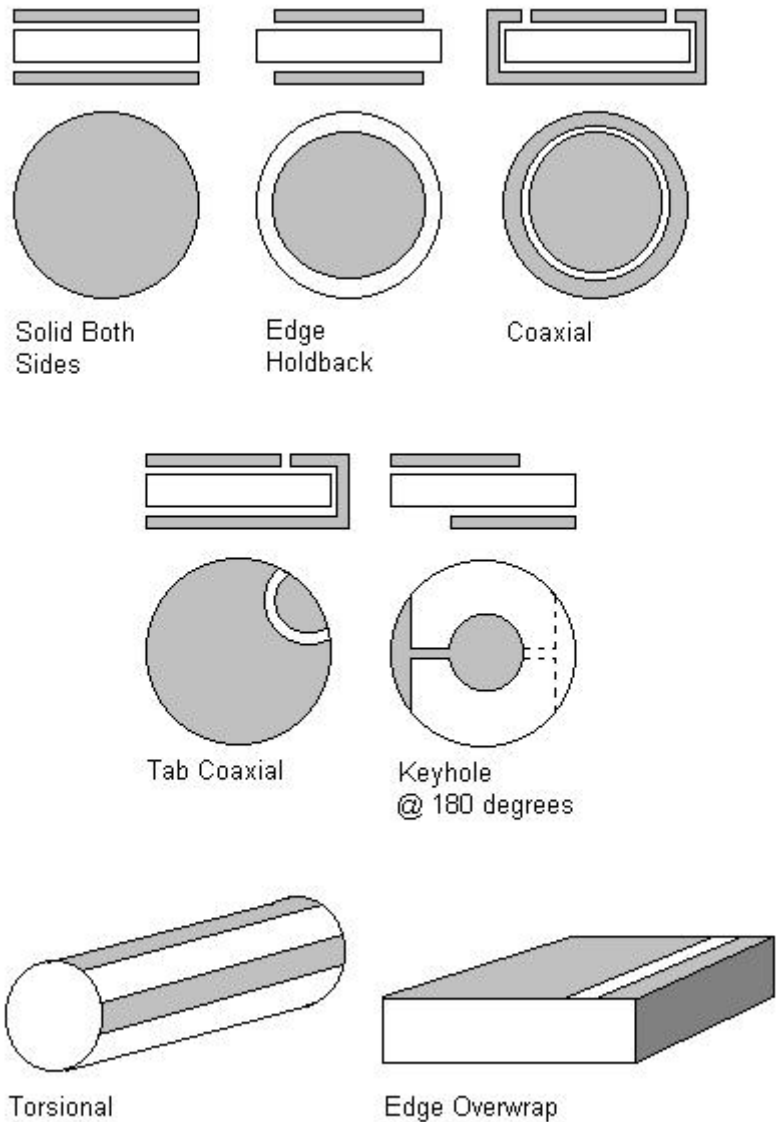
Two surface finishes are standard: 3 micron fine lapped for fundamental operation, and our proprietary chemical polish for overtone operation.

Note: Overtone polish is available on all our materials. The flatness and parallelism will vary with the material and especially the thickness. We do not quote specific numbers of flatness and parallelism, but we guarantee that the crystals will resonate at the 3rd, 5th and 7th overtones. Some crystals can be made to very specific degrees of flatness and parallelism. This is a function of size. Please request a quotation.

Electrodes

Vacuum-deposited electrodes enable us to achieve optimum frequency match in a variety of patterns. These thin ($\approx 3000\text{\AA}$) electrodes maintain the flatness, parallelism and surface quality of the crystals

and do not overload thin, high frequency crystals. Standard electrodes are vacuum-deposited chrome/gold, chrome/silver, chrome, copper, titanium, and aluminum. Also offered are electroless nickel, copper and gold, and fired palladium/silver, silver, gold and platinum/gold.



Many special patterns are available, and custom masks can be made to your specifications. (Not all patterns are available in all electrode materials.)

Leads

Soldered wire leads, appropriate to the size and frequency of the crystals, are available. Or, we will gladly explain how to make your own soldered connections onto our electrodes.

General Specifications

Material	Mode of Vibration	Fundamental Frequency Range & Tolerances	Flatness	Parallelism
Quartz	Compressional, Shear, Length Extensional, Torsional	50 KHz - 100 MHz +/- 5%	To within 0.00002"	To within 0.00005"
Lithium Niobate	Compressional, Shear, & Triple Mode	250 KHz - 40 MHz +/- 5%	To within 0.00002"	To within 0.00005"
Lead Zirconate Titanate	Compressional, Shear, & Dual Mode	100 KHz - 30 MHz +/- 5% 40 MHz +/- 10%	To within 0.00005"	To within 0.000015"