



Boston Piezo-Optics Inc.

SOLDERING WIRES TO BOSTON PIEZO-OPTICS TRANSDUCER CRYSTALS

We produce a large variety of crystal materials in an endless combination of sizes, shapes and thicknesses. Because many of our crystals are polished and made to frequencies of 20 – 50/100 MHz we electrode our crystals with a thin coating (approx. 2500 Angstroms) of vapor-vacuum deposited chrome/gold.

This coating is mechanically fragile but wires can readily be soldered using the following technique:

1. Having selected the wire of your choice and stripped insulation from one end if necessary, use your equipment to form a small ball of solder on the end of the wire. Typically, the ball will be two or three times the diameter of the wire.
2. Using a toothpick or similar applicator, apply a drop of liquid flux on the crystal at the location where you wish to attach the wire.
3. Holding the wire with tweezers place the solder ball end onto the crystal in the liquid flux.
4. With an ABSOLUTELY CLEAN soldering iron touch the wire about 1/8" above the solder ball. In seconds the solder ball will melt and create a good soldered connection. NOTE – do not touch the crystal with the soldering iron and do not allow the tip of the iron to attract solder and the gold coating from the crystal up the wire toward the iron.
5. Place the crystal/wire combination into a tray of appropriate solvent for the liquid flux you have chosen. After a good soak and perhaps some gentle agitation, the crystal can be air-dried or blow-dried (gently).

This method allows us to solder single and small gage multi-strand wires to fine lapped and overtone polished crystals with our standard chrome/gold electrodes. Crystal thicknesses from 0.004" and greater are easily accommodated.

We use readily commercially available flux and solder – there are no “tricks” of unnamed items or process steps. Our soldering iron is usually set at 600° F. Of prime importance is the use of an absolutely clean iron for step #4. In extreme cases we have made aluminum tips for our soldering irons since what we want is essentially a “point-source” of heat.