QUANTUM TECHNOLOGY, INC.
108 Commerce Street • Lake Mary, Florida 32746
(407) 333-9348 • FAX (407) 333-9352 • Toll Free (800) 232-4291
Email staff@quantumtech.com • Internet http://www.quantumtech.com

June 11, 1998

INSTRUCTIONS FOR HANDLING POLISHED CRYSTALS OF B-BBO

(BETA-BARIUM BORATE)

1. These crystals are slightly soluble in water. The polished faces degrade when left exposed to humid atmosphere. These faces should not be cleaned with any solvent like alcohol or methanol. Also, they should not be wiped with cloth or kleenex tissue. Sleeks are easily produced by this procedure. If the crystal is mounted in a cell without any windows, the crystal faces will be fogged after a few days. It is best to use windows and/or store the cell in a desiccator.

2. Dust particles on the polished faces should be blown off by a jet of dry nitrogen or from a microduster.

3. The hardness of these crystals is about 4 on Moh's scale of hardness.

4. The melting point of these materials is over 800 C and they can be AR coated. Do not touch the polished faces or AR coated faces with fingers or breathe near the faces.

5. If the crystal is dropped, it would produce cleavage or breakage which would render it unusable. Please avoid mechanical shock, as well as thermal shock.

6. These crystals may contain minute imperfections and small inclusions which are unavoidable due to the high temperature growth process. These are still in early stages of development and optical quality would be improved with more experience with the growth process.

7. Polishing of water soluble crystals require techniques different than those commonly used for glass. We can restore the original laser grade polish and recoat the crystals after polishing. The turn-around time is normally two weeks. Please get a return authorization before shipping and evaluation for charges will be made after the crystals arrival.

8. The optical axis is shown by a line on one face of the crystal and the input polarization is 90° to that. Smaller crystals have a dot indicating the top and polarization is horizontal. If cut at an angle it is indicated by a line on the side face and input polarization is 90° to that side.

QUANTUM TECHNOLOGY, INC.
108 Commerce Street • Lake Mary, Florida 32746
(407) 333-9348 • FAX (407) 333-9352 • Toll Free (800) 232-4291
Email staff@quantumtech.com • Internet http://www.quantumtech.com

June 11, 1998

INSTRUCTIONS FOR HANDLING POLISHED CRYSTALS OF

LBO, LiNbO3, KTP AND OTHER HARD CRYSTALS

1. These crystals are not water soluble. However they are polished to laser grade finish and therefore the polished faces should not be handled with bare fingers.

2. Dust particles on the polished faces should be blown off by a jet of dry nitrogen or from a microduster. Do not attempt to clean the polished faces with any solvent such as Acetone or methanol. Also do not attempt to wipe the faces with cloth or kleenex. Sleeks are likely to be produced by such procedure.

3. The hardness of these crystals is about 5 on Moh's scale of hardness.

4. The melting point of these materials is over 800 degrees C and they can be AR coated. Do not touch the polished faces or AR coated faces with fingers or breathe near the faces.

5. If the crystal is dropped, it would produce cleavage or breakage which would render it unusable. Please avoid mechanical shock as well as thermal shock.

6. The crystals may contain some minute imperfections and small inclusions which are unavoidable due to the high temperature growth process. These are still in early stages of development and optical quality would be improved with more experience with the growing process.

7. Quantum Technology, Inc. would be pleased to repolish the surface and restore the original laser grade polish. Any AR Coating will need to be redone after polishing. The turn-around time is normally two weeks. Please get a return authorization before shipping the crystal and evaluation for charges will be made after its arrival.

8. The optical axis is shown by a line on one face of the crystal and the input polarization is 90° to that. Smaller crystals have a dot indicating the top and polarization is horizontal. If cut at an angle it is indicated by a line on the side face and input polarization is 90° to that side.

November 1, 1990

QUANTUM TECHNOLOGY, INC.

Quantum Park • 108 Commerce Street • Suite 101
Lake Mary, Florida 32746-6212 / U.S.A.
Telephone: (407) 333-9348 / FAX: (407) 333-9352
Cable: QUANTECH / Telex: 372-7798

STORAGE AND HANDLING OF POLISHED CRYSTALS

1. The crystals are water soluble, fragile (hardness about 2 on Moh's scale) and very sensitive to thermal shock. Those who intend to use these crystals should know proper storing and handling procedure.
2. Open the package carefully in a dustfree and relatively dry (relative humidity of less than 60%) atmosphere.
3. Please use gloves to handle these hygroscopic crystals. Hold the crystal only at the non-polished faces. Bare fingers will itch the surface. Rubber finger cots can also be used to handle the non-polished faces.
4. Do not attempt to clean the polished faces by wiping with a kleenex tissue. It may produce a scratch or a sleek. Dust on the polished surface can be blown off by a jet of dry nitrogen.
5. The crystals are temperature sensitive. Drastic chilling or warming (at a rate exceeding 5°C/min) will cause shattering by thermal stresses. The crystals should not be heated above 120°C as slow decomposition may take place.
6. Crystals should be brought to room temperature condition slowly enough from a cooler condition to prevent moisture condensation on their surfaces. Holding the crystal near the breath will destroy the polish.
7. KDP type crystals should be stored in a dessicator or in a container of minimum gas volume. Lithium Formate and Potassium Pentaborate crystals should be stored in a fluorocarbon fluid. These two crystals contain water of crystallization.
8. If the crystal rod is 45°Z cut for temperature tuning, the optic axis is shown by a vertical line on one face. If the crystal rod is a doubly rotated bar for angle tuning the optic axis is shown by a tilted line on one face.
9. If you have requested anti-reflection (AR) coatings on the polished faces, MgF_2 coatings are deposited on the faces. The coatings are soft; therefore, please do not wipe the faces. The AR coated crystal is held on to a glass slide by a double adhesive tape. Gently pull the crystal to remove from the slide.
10. Polishing of water soluble crystals requires techniques different from those commonly used for glass. If the polished faces are degraded, we recommend that the crystal be sent back for repolishing. The charge for repolishing two faces of the crystal will be decided upon inspection.

QUANTUM TECHNOLOGY, INC.
108 Commerce Street • Lake Mary, Florida 32746
(407) 333-9348 • FAX: (407) 333-9352

INSTRUCTIONS FOR ANGLE TUNED CELLS WITH TYPE I CRYSTALS

1. The polished crystal is properly cut and oriented for SHG and mounted inside the cell. The input and output windows are made of fused quartz. The cell is normally filled with fluorocarbon fluid to index match the crystal as well as to prevent degradation of the polished faces due to humid atmosphere.

2. KDP type crystals are hygroscopic. For high peak powers, "dry" type cell, filled with inert gas is preferable in the case of KDP type crystals.

3. The input and output windows are normally AR coated at the appropriate wavelengths. The input side marked "IN" is coated for the fundamental wavelength. Do not attempt to clean AR coated faces with Acetone or other organic solvent. Dust on the surfaces should be blown off by a jet of dry air.

4. When the cell is mounted horizontally in an optical mount, the screw (for filling the fluid) should face the ceiling. The polarization of the input beam should be horizontal. Slight rotation and/or angular adjustment is required to obtain optimum efficiency. A line is milled on the input end plate to indicate the direction of the plane of polarization of the input beam.

5. When tuning is achieved, the optic axis shown by a line on one of the side faces of the crystal will make the correct tuning angle with respect to the plane of polarization. The face containing these lines is visible when one examines the crystal faces by slight tilting of the cell.

6. Do not attempt to take the cell apart. When the index matching fluid is depleted, open the screw (for filling the fluid) and fill the cell with the clean fluid through a swinnex filter. Extra fluid can be purchased from us.

7. When the cell is sent for repair, a charge will be decided upon inspection.

8. The SHG cell is guaranteed for three months from the date of purchase. Any optical or electrical misuse will nullify the warranty. Please contact the sales department if you have any problems or if you wish to send it for repair.

QUANTUM TECHNOLOGY, INC.
108 Commerce Street • Lake Mary, Florida 32746
(407) 333-9348 • FAX (407) 333-9352 • Toll Free (800) 232-4291
Email staff@quantumtech.com • Internet http://www.quantumtech.com

INSTRUCTIONS FOR ANGLE TUNED CELLS WITH TYPE II CRYSTALS

1. Type II process requires an input beam which is either unpolarized or plane polarized. The crystal rod is so oriented that the input beam is split, within the crystal into an O ray and E ray of equal amplitude.

2. The polished crystal rod is properly oriented and mounted inside the cell. Input and output windows are made of fused quartz. The cell is normally filled with dry nitrogen to prevent degradation of polished faces due to humid atmosphere. When requested, the cell will be filled with fluorocarbon fluid (FC 104 or FC 43) to obtained better index-matching which reduces reflection losses.

3. The windows are normally AR coated. The input side marked "IN" is coated for the fundamental wavelength. Do not attempt to clean AR coated faces with Acetone or other organic solvents. Dust on the surfaces should be blown off by a jet of dry air.

4. When the cell is mounted horizontally in an optical mount, the screw (for filling the fluid) should face the ceiling. The polarization for the input beam should make an angle of 45° with respect to the horizontal or vertical plane. Slight rotation and/or angular adjustment is required to obtain optimum efficiency.

5. Type II process is more efficient because the acceptance angle is wider, making alignment and thermal control less critical than in Type I process, especially for doubling 1060nm. For tripling two orthogonally polarized beams, this process is attractive if the crystal is cut at the proper angle for tripling. The distance between the doubler and tripler should be as small as possible for best efficiency. Two orthogonally polarized beams should make an angle of 45° when the cell is oriented as in instruction 4.

6. Do not attempt to take the cell apart. When the index matching fluid is depleted, open the screw (for filling the fluid) and fill the cell with the clean fluid through a swinnex filter. Extra fluid can be purchased from us.

7. When the cell is sent for repair, a charge will be decided upon when it is inspected.

8. The SHG cell is guaranteed for three months from the date of purchase. Any optical or electrical misuse will nullify the warranty.

Since 1969

We Make It Crystal Clear