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**BBO POLYCOAT  
HIGH DAMAGE  
THRESHOLD AR COATING**

**DATA SHEET 717**

## **NEW POLYMER ( AR COATED ) DRY KD\*P, BBO POCKELS CELLS & SHG / THG CRYSTALS**

Quantum Technology announces the development of a Polymer Coating (AR PolyCoat) for dry BBO (QS series), KD\*P (QC series) Pockels cells, or for dry SHG / THG Crystals of BBO, LBO, KD\*P or CD\*A mounted with windows. These proprietary high damages single layer Anti-Reflective (AR) coating bonds directly onto the crystal faces in a vacuum chamber. This coating has excellent index matching properties and also serves as a good Protective Coating for these hygroscopic crystals. This single layer AR PolyCoat process is available at any specific wavelength from 360 nm to 1064 nm. This research and development work was performed in a cooperative effort under a CRADA Project of the Lawrence Livermore National Laboratory and the staff of Quantum Technology, Inc. The Damage Threshold measurements were carried out with a flash lamp pumped Nd:YAG laser (1064 nm) at 10 Hz, at CREOL of the University of Central Florida.

Used as a complete Pockels cell assembly, standard AR coatings cover both faces of the windows and the Polymer AR coating on the crystal faces. The cell is filled with dry nitrogen, eliminating the problems of liquids such as Decalin or FC. The total Reflection Loss of the Pockels cell under these conditions is < 1% at 1.064 nm for crystal faces and < 1% for window AR faces for a total of < 2%. This process is not a SOL-GEL<sup>R</sup> coating, but an exclusive process developed and produced by Quantum Technology, in collaboration with LLNL expertise.

Damage measurements on this coating were made with a flash lamp diode pumped Nd:YAG laser. Under this condition, the damage threshold was greater than 27 GW/cm<sup>2</sup> peak irradiance, and 0.78 J/cm<sup>2</sup> peak fluence, for 16.7 picosec pulse width. This new "DRY" design is free from any fluid related problems, such as, fluid leakage and air bubbles. The reflection loss on BBO and LBO surfaces is <0.25%/surface. Hermetically sealed and filled with dry nitrogen gas (DRY N<sub>2</sub>), the Pockels Cell performance is not affected by its position (vertical or horizontal). Please note that the double crystal Pockels devices are useful for extra-cavity switching and also at higher wavelength operation up to 2.1 micron (Nd:Holmium) in Pockels Cell Model QS (BBO). These Pockels cells are available as QS or QC series. For dry SHG or THG crystals such as KD\*P or CD\*A the total reflection loss is <2 %. Quantum Technology grows KD\*P, CD\*A and other crystals up to 99 % deuteration level for Non-Linear Optical Applications.