

AbstractID: 5273 Title: Characterization of EBT versus MD55 Gafchromic® films for relative dosimetry measurements

**Purpose:** To evaluate the EBT® radio-chromic film for relative dosimetry in comparison to MD55®.

**Method and Materials:** For dose-response study, EBT and MD55 films were irradiated to dose ranges 0-15 and 0-40 Gy respectively. Photon beam energies of 6 and 18 MV were used to study energy dependence. Films were scanned using a scanner from Microdensitometer Photoelectron Corporation. The scanner uses a CCD camera. The two diffused-light beds using light-emitting diodes, operating at 636 and 665 nm, were used for EBT and MD55 films respectively. For flat-field subtraction at start of a scanning session, in case of EBT, an un-irradiated film was scanned employing a black mask covering the light box's area outside the film. In case of MD55, un-masked light box without a film was scanned for the flat field subtraction. For fading study, films were read over a period 2-20 days after irradiation. For light sensitivity, un-irradiated films were exposed to florescent light to 6 hour maximum.

**Results:** Unlike MD55, light sensitivity of EBT is found to decrease with pre-irradiation level. With 2Gy pre-irradiation, it is comparable to MD55. Fading of EBT is comparable to MD55. The small energy dependence observed beyond 8Gy for EBT is considered negligible. Percent uncertainty in relative-dose determination from two OD values is obviously expected to increase with separation between the OD values, and to be higher at lower OD levels. It is comparable for both films, and is typically estimated to be 0.8% for determination of 50% of 2Gy.

**Conclusions:** Dosimetry characteristics of EBT are comparable to MD55. Its higher sensitivity to radiation and availability in larger size makes it preferable as a relative dosimeter for RPC use.

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