

AbstractID: 3407 Title: Finding the optimal digitizer for use with Gafchromic EBT film

**Purpose:**

When performing a QA procedure using film the accuracy of the calculated dose is dependant on the digitizer. The ideal digitizer would have high sensitivity, density stability and uniformity. Our goal is to find the best scanner for use with the newly introduced Gafchromic EBT film.

**Method and Materials:**

We first exposed the EBT and EDR2 films to IMRT patterns with a maximum dose of 200cGy and generated a calibration film, which consists of 26 dose steps from near zero to 250cGy. The films were scanned on our Vidar Dosimetry Pro, as well as two Epson and two Microtek flatbed scanners. Film dosimetry software was used to analyze the films, by comparing the generated dose maps from EBT films to EDR2 films.

**Results:**

In comparison we found that the EBT film performed best on the Epson scanners and yielded a sensitivity 1.5 times greater than the Vidar, due to the film's absorption peak matching the red color channel of the Epson. Microtek's sensitivity equals the Epson, but noise levels are up to 5% compared to 1% on the Epson and Vidar. In comparing EBT to EDR2 we found there is no difference when scanned on the Epson or Microtek, but the Vidar showed high dose levels to be 8% lower with EBT due to a large point spread function altering the calibration curve. Comparing scanners shows that the noise level in dose is reduced on the Epson by 1.5 with EBT over the Vidar, while EDR2 remains the same and equal to the EBT on Epson. Microtek yields noise up to five times greater than the Epson.

**Conclusion:**

Digitizing on the Epson scanners utilizing the red color channel yields the best results. Similar results are attainable if an average scanning technique is utilized with Microtek scanners.