Purpose: To evaluate the dosimetric characteristics of the newly released Gafchromic EBT3 film and determine its suitability for surface dose measurements of 6MV x-ray beams.

Methods: Sheets of Gafchromic EBT3 film (Ashland Specialty Ingredients, NJ, USA) were cut into rectangular samples according to the providing user guide. All irradiations were performed using the 6MV x-ray beam on a Novalis linear accelerator (Varian Medical Systems). Optical density (OD) - dose calibration curves were determined by irradiating different film samples with doses in the range from 0 to 3 Gy and were read out using an X-rite densitometer using multiple readings over the samples surface. The OD was measured at different times after irradiation in order to determine stability of the film development. Surface doses were determined by placing film samples on the surface of a Virtual Water phantom for a range of field sizes from 3—3 to 20—20 cm2.

Results: Sheets of Gafchromic EBT3 film (Ashland Specialty Ingredients, NJ, USA) were cut into rectangular samples according to the providing user guide. All irradiations were performed using the 6MV x-ray beam on a Novalis linear accelerator (Varian Medical Systems). Optical density (OD) - dose calibration curves were determined by irradiating different film samples with doses in the range from 0 to 3 Gy and were read out using an X-rite densitometer using multiple readings over the samples surface. The OD was measured at different times after irradiation in order to determine stability of the film development. Surface doses were determined by placing film samples on the surface of a Virtual Water phantom for a range of field sizes from 3—3 to 20—20 cm2.

Conclusions: The Gafchromic EBT-3 film has shown to be a stable and useful dosimeter for megavoltage x-ray beams including the determination of surface dose.