GAFCHROMIC™ XR-CT2 dosimetry film User protocol

Rev 0.3

I. **PURPOSE**

This protocol is for use in determining the beam slice width delivered by CT scanners

II. **SCOPE**

This procedure applies to all CT scanners

III. **EQUIPMENT AND MATERIALS**

> CT scanner
> GAFCHROMIC CT2 film strips
> Stand - a stand is a rectangular object which is used to elevate the GAFCHROMIC CT2 film strip above the table and at the isocenter of the scanner. A suitable stand could be, for example, a small box (latex glove boxes are often available), a block of plastic (e.g. polystyrene, water equivalent plastic, etc.) or a stack of paper.
> Beekley spot (or other metallic point marker)
> Flatbed film scanner (optional)
> Image analysis software (optional)

IV. **PROCEDURE**

1. The protocol assumes that the CT scanner has been warmed up and is operating to the manufacturer's specification.

2. Place the stand on the patient couch – see Figure 1

Figure 1

3. Place a Beekley spot at the center of the top of the stand. Use the couch movements to bring the Beekley spot to the isocenter of the CT scanner – see Figure 2. Conduct a test scan to confirm that the Beekley spot is at the isocenter. Adjust the couch required to bring the Beekley spot to the isocenter.

Figure 2

4. Figure 3 is a black/white diagram of a GAFCHROMIC CT2 film strip. The strip has a metric scale. The smallest divisions are mm. The scale runs from -50 mm to +50 mm. Note that the film strip has a number printed at the bottom (#1 in the figure). This number is a unique identifier of the strip.
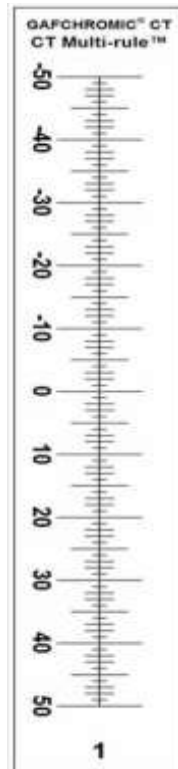

Figure 3

Replace the Beekley spot with a GAFCHROMIC CT2 film strip. Place the long axis of the strip parallel to the axis of the CT scanner – i.e. the axis perpendicular to the x-ray beam. Position the 0 mm mark on the scale at the isocenter of the scanner – Figure 4. It is helpful to turn on the laser indicators on the CT scanner to facilitate the positioning and alignment of the film strip.

Figure 4

5. Set the control of the CT scanner to deliver the slice width that is to be measured.

6. Set the tube controls to produce an exam for a typical abdomen or head scan. In the past they have been found sufficient to darken GAFCHROMIC CT2 film strips so that they can be visually observed and easily measured. However, lesser or greater exposures may be desirable if the darkening is too great or too little.

7. Remove the GAFCHROMIC CT2 film strip from the scanner. Make a record of the number of the film strip and the conditions of the scan.

8. Observe the slice width on the film strip and utilize the printed scale to measure the slice with. Record the slice width.

9. Alternatively the GAFCHROMIC CT2 film strip can be placed on a flatbed scanner and scanned. Image analysis software may then be used to measure the profile across the exposed portion of the film strip and thereby determine the slice width. Record the slice width.

10. If other slice widths of the CT scanner are to be evaluated repeat Steps 5 to 10, using a separate GAFCHROMIC CT2 film strip for each slice width.

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12. Exposed GAFCHROMIC CT2 film strips should be stored in the dark at room ambient temperature.

V. **REVISIONS TRACKING**

Rev. 0.3