

LETTER TO THE EDITOR

Radiochromic film: the new x-ray dosimetry and imaging tool

Dear Editor,

Medical x-ray imaging of delivered radiation dose to a patient, phantom or industrial x-ray imaging of a specific object can be obtained with as little as 2 cGy by radiochromic film automatically and without development. Radiochromic film is now an essential tool for both medical and industrial purposes, especially in areas where an accurate alignment is required which may not be allowed with a digital image intensifier or standard radiographic film which must be removed from the area of interest and processed before results can be obtained. Radiochromic film produced by some manufacturers is now affordable and priced competitively against ready pack radiographic films.

Evaluation, dosimetry, imaging or testing using these radiation sources can be performed with radiochromic films, devices that have the ability to produce a permanent visible colour change upon irradiation¹. Within the last ten years, the use of radiochromic films has expanded rapidly in the medical world due to commercial products becoming more readily available. Higher sensitivity films and technology advances in imaging have allowed scientists to use two-dimensional dosimetry more accurately and inexpensively. Radiochromic films are now available in formats that have accurate image definition and measurement ranges from 2 cGy up to many kGy². Very soon products will be available that can detect doses within the 0.1 cGy range. Some radiochromic films have a relatively energy independent dose or colouration response whereas others have characteristics matching more closely to silver halide radiographic films. Medical applications cover therapeutic radiotherapy applications as well as diagnostic procedures requiring fluoroscopy such as cardiac catheterisation³. The introduction of low sensitivity radiochromic film has allowed medical physicists and doctors to accurately estimate the doses delivered to patient's in-vivo.

Industrial applications for radiochromic film could incorporate imaging of scientific and industrial devices for accurate positioning within structures (an example shown in Figure 1) or other areas traditionally screened with radiographic film or digital x-ray imaging. The advantage radiochromic film holds over other radiation detectors is its automatic readout and colouration. This allows the film to be left in position whilst analysis is performed, which could hold a significant advantage for areas that require accurate alignment.

In conclusion, radiochromic film provides a new method for radiation dosimetry and imaging which has



Figure 1. Figure 1 shows an x-ray image of an ionisation chamber taken using XR type R radiochromic film. No chemical processing or development is required. A direct image is formed upon irradiation. This type of film has a yellow initial colour which turns blue/brown with radiation exposure.

many applications throughout medical and industrial fields. It is quickly becoming the new film for x-ray dosimetry and imaging.

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