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PAPER TITLE TYPE TESTING OF THE HARSHAW EXTREMITY AND WHOLE BODY PERSONAL MONITORING DOSEMETERS FOR PHOTON AND ANGULAR RESPONSE

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ABSTRACT (See instructions overleaf)

The Harshaw 6600 personnel monitoring system can be used to measure extremity doses using ext-rads and whole body monitoring using three or four element cards. Limited performance data on these two systems is available specifically of relevance to usage in hospitals. The ext-rad comprises of a single dosemeter element, the chipstrate consists of a 3 by 3mm chip of LiF thermoluminescent material hermetically bonded to a kapton substrate to which a barcode strip has been attached. The whole body dosemeter consists of a TLD card and holder. The card consists of 3 solid LiF TL elements. The holder which is made of ABS plastic contains various filters for radiation type and energy discrimination.

Both these types of dosemeter have been type tested for their response to different photon energies ranging from 45-104keV and o°, 20°, 40° and 60° angles of incident of the photon beam. Both angular and energy response were assessed on a 30 x 30 x 15cm PMMA phantom and on a 30 x 30 x 30 cm water phantom. All irradiations were done using the ISO wide spectrum series reference radiations.

The radiation dose quantity Hp(0.07) was calculated for the extremity monitor and both Hp(0.07) and Hp(10) were calculated for the whole body card. All the results were normalised to the dosemeters response to Cs137. All measurements were compared with the true dose in the phantom using previously published conversion coefficients, with a view to assessing the performance of the dosemeters according to the recommendations of the ICRP.