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TÍTULO EVALUATION OF X-RAY TUBES FOCAL SPOT DIMENSIONS USING A DIGITAL SENSOR**TITLE EVALUATION OF X-RAY TUBES FOCAL SPOT DIMENSIONS USING A DIGITAL SENSOR****Autor: Paulo R. Costa, Denise Yanikian, Tânia A. C. Furquim**

Resumo: Introduction Standard methods for measurement of diagnostic X-ray tube focal spot dimensions use images obtained from pinhole cameras, slit cameras or star patterns. The second edition of International Electrotechnical Commission (IEC) 336 standard (1994) proposes the use of a slit camera for the determination of focal spot size as well as for the evaluation of the modulation transfer function (MTF). The use of fine-grain direct exposure films in order to registrate the focal spot images is recommended. The present work proposes the use of an image digitalizer device as an alternative method for replacing direct exposure X-ray films.

Materials and Methods The proposed method uses a CCD based device to capture images (Sens-a-ray, Regan Medical Systems) in place of the IEC direct exposure film. Measurements using both registration methods were performed with a 10 mm slit camera (Europin, lie) and a 75 mm pinhole camera (Victoreen, Inc) in a double focus X-ray tube (Rörlix 150/30/50) with nominal size focal spot 1.2 x 1.2 mm² for small focus and 2.0 x 2.0 mm² for large focus. System's alignment and image quality reference level follow IEC 336 publication recommendations. The film images were backlighted and read by using magnifying lens with a built-in graticule. These image registration systems were evaluated in terms of its performance and time consumed during a complete set of measurement.

Results Figure 1 shows the large focus Sens-a-ray image of the Rörlix tube obtained from the pinhole camera. Results for focal spot size using the digital device were 1.2 x 1.5 mm² for small focus and 1.4 x 2.2 mm² for large focus while direct exposure system were 1.6 x 2.2 mm² for small focus and 1.7 x 2.6 mm² for large focus. The average time consumed during digital measurement was about 5 minutes while for the IEC procedure this time was about 80