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Multiparameter double hole contrast detail phantom: Ability to detect image displacement due to off position anode stem

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Abstract

Contrast Detail phantom is a quality control tool to analyze the performance of imaging devices. Currently, its function is solely to evaluate the contrast detail characteristic of imaging system. It consists of drilled hole which gives effect to the penetration of x-ray beam divergence to pass through the base of each hole. This effect will lead to false appearance of image from its original location but it does not being visualized in the radiograph. In this study, a new design of Contrast Detail phantom's hole which consists of double hole construction has been developed. It can detect the image displacement which is due to off position of anode stem from its original location. The double hole differs from previous milled hole, whereby it consists of combination of different hole diameters. Small hole diameter (3 mm) is positioned on top of larger hole diameter (10 mm). The thickness of double hole acrylic blocks is 13 mm. Result revealed' that, Multiparameter Double Hole Contrast Detail phantom can visualize the shifted flaw image quality produced by x-ray machine due to improper position of the anode stem which is attached to rotor and stator. The effective focal spot of x-ray beam also has been shifted from the center of collimator as a result of off-position anode stem. As a

conclusion, the new design of double hole Contrast Detail phantom able to measure those parameters in a well manner. © 2015 AIP Publishing LLC.

Author keywords

Acrylic block; Anode stem; Contrast detail phantom; Double hole design; Image displacement

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