

Comparative study for image properties on film and digital radiography

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The computed radiography (CR) standards ISO 16371-1 and ISO 17636-2 correspond to the radiographic test film (RT-F) standards ISO 11699-1 and ISO 17636-1, respectively. In RT-F, the image recorded and observed on a single identical film, whereas in RT-D, the processes of "taking an image" and "observing an image" are independent, and the "observing" process consists of observing an image whose brightness, contrast, etc., have been adjusted. This report describes the results of a comparison of radiographic images by RT-D (CR) and RT-F in terms of the captured images image quality parameters and visual observation of by separating the two processes of "capturing" and "observing". For the experiments, the specimens simulating welds were used, and RT-D (CR) and RT-F images were taken according to ISO17636-1 and ISO17636-2. The line profiles of the wire-type image quality indicator placed on the base metal and the weld joint were obtained, and the image quality parameters such as pixel value, SNRN, SRb and density were measured. For F-RT, the film characteristic curve of the film was used to convert the measured concentration values into values corresponding to the transmitted X-rays incident on the film, and from these values, image quality parameters such as pixel value and SNRN were obtained. Also, observations were made by several qualified observers to compare the discriminability of the RT-D and RT-F images. The results showed that despite nearly identical image quality parameters in the "capture" process, the discrimination results in the "observation" process differed depending on individual differences among observers and the adjustment of the window level and window width during observation.