

C618761 : MAJOR NUCLEAR TECHNOLOGY

KEY WORD: BETA BACKSCATTER / TWO DIMENSIONAL IMAGING / SCANNING SYSTEM
SUPASIT KHAWERAT : DEVELOPMENT OF A RADIATION BACKSCATTER SCANNING
SYSTEM FOR TWO-DIMENSIONAL IMAGING. THESIS ADVISOR : ASSIST. PROF.
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The use of radiation backscattering technique for inspection of defects in coated-sheet metal gives better advantage than the transmission technique because a set of radiation source and detector can be fixed at the same side of the object. A radiation backscatter scanning system for two dimensional imaging is developed with digital real time displaying on non-interlace scanning system television. The backscattering probe driving mechanism is designed for scanning $40 \times 30 \text{ mm}^2$ surface area with 1 mm step resolution. The CP-AT32 microcontroller is employed to control the imaging data collection, real time imaging display on television and data transferring to PC-microcomputer. This scanning system provides an image resolution of 400×300 pixels with 256 contrast levels and can be stored 2 images on 320 kbyte memory capacity.

The Pm-147 beta source of 3.85 MBq activity, 223 keV of energy and a 2.5 cm diameter of end-window GM counter are coaxially arranged with 1 mm collimator as a backscatter probe for imaging data collection at a scanning rate of 230 s/scan line. The result reveals that the scanning system is properly operated with 2 mm image resolution and with good contrast. The beta source with higher energy can be used to inspect the deeper defects in coated-sheet metal.

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