

Development of High Resolution X-ray Imaging Screens for Non-Destructive Testing of Machine Parts

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X-ray imaging screens are also known as X-ray radiographic films are commonly used in non-destructive testing (NDT) to inspect the integrity of various objects and materials. NDT techniques allow for the evaluation of internal structures, defects, and anomalies without causing damage to the tested item. However, with the advancements in digital imaging technology, digital X-ray detectors have become increasingly popular. These detectors capture the X-ray image electronically, eliminating the need for film processing. The typical process includes preparation of suitable phosphor such as $Gd_2O_2S:Tb^{3+}$ using novel sulfurization technique, uniform coating on metallic substrate by a novel gel-settling method developed by our group and image analysis to detect any defects or irregularities, such as cracks, voids, inclusions, or structural abnormalities in the films. Apart from that proper safety precautions that needs to be taken are highlighted to ensure that the X-ray radiation is contained and does not pose a risk to personnel.

X-ray imaging screens are widely used in industries such as aerospace, automotive, manufacturing, oil and gas, and many others. They provide a valuable NDT method for quality control, ensuring the safety and reliability of critical components and structures. The transition from film-based to digital X-ray detectors has brought numerous advantages, including faster image acquisition, enhanced image manipulation, and easier storage and sharing of digital files.

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