

2.13. FLAW DETECTOR ON THE BASIS OF PULSE X-RAY APPARATUS AND FLAT DETECTING PANEL OF FLASHSCAN 35 TYPE

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Paper presents results of works on creation of portable X-Ray complex on the basis of flat detecting panel.

In portable screening complexes, X-Ray optic transducers on the basis of X-Ray fluorescence screen and CCD matrix are used, as a rule. Their disadvantages include: significant thickness impeding testing in places with restricted access and narrow dynamic range.

Recently, flat detecting panels appeared, where X-Ray sensitive layer (scintillator) is applied directly on semiconductor matrix on the basis of amorphous silicon. Besides operational convenience due to the smaller thickness, flat detecting panels allows higher image quality (image geometric resolution and dynamic range) to be achieved.

Paper discusses presents results of works on creation of portable X-Ray complex on the basis of flat detecting panel of FlashScan 35 type. As a source of radiation, X-Ray apparatus of pulse type with anodic voltage of 150 kV is applied in the complex. It provides transmission ability of up to 25 mm for steel and has the weight of 6.2 kg, including built-in protection against unused radiation.

Authors have developed the portable complex "Planshet" possessing with following main characteristics:

- dimensions of testing zone: 293×406 mm;
- transducer matrix resolution: $2,240 \times 3,200$ pixels;
- geometric resolution: 4.0 pairs of lines/mm across the whole testing zone;
- number of grey levels in image: 14 bits;
- relative testing sensitivity: 3% with steel thickness of 22 mm;
- testing time: 1 s.

Paper presents results of testing by means of "Planshet" complex; comparative analysis of possibilities of "Planshet" complex and portable inspection X-Ray and TV sets on the basis of X-Ray fluorescence screen and CCD matrix is provided. Possibilities of application of the portable X-Ray complex on the basis of flat detecting panel for testing of welded joints are considered.