

1.4.30. SCOPES OF COMBINED APPLICATION OF NEUTRON AND X-RAY DIGITAL RADIOGRAPHY

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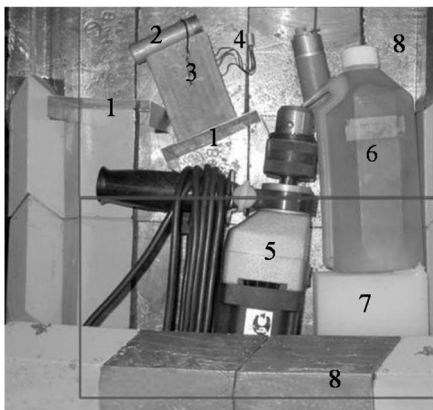
The paper considers characteristic properties of combined application of neutron and X-ray radiation for radiographic inspection of industrial products.

The paper describes a unique NDT complex developed at VNIIA which includes portable generators of fast (14 MeV) neutrons, X-ray generators, a compact pulsed betatron, a tomographic scanner; digital imaging systems based on CCD-detectors, a linear detector and Imaging Plates, a software package as well.

Examples of the complex application for inspecting various products made of low density organic material as well as of high Z metals are presented.

It has been shown that combined application of neutron and X-ray radiation broadens the range of inspected products, enlarges the reliability of radiographic control, and gives new opportunities to determine material composition of inspected products.

The presented radiographic image demonstrates the capability of the described complex to inspect containers made of heavy metals with portable equipment.



Left – photo of objects layout in a lead box (the near wall is removed to show the content); right – radiographic image obtained with a portable generator of 14 MeV neutrons ING-07 at exposure time 30 min:

1 – 2 mm thick iron plates; 2 – a cartridge; 3 – a soap bar; 4 – a fuse dummy 7 mm in diameter; 5 – an electric drill; 6 – a plastic bottle with liquid; 7 – a polyethylene brick; 8 – 5 cm thick lead bricks