

EXAMPLES OF X-RAY TOMOGRAPHY AND POSSIBLE HOT APPLICATIONS

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ABSTRACT

Major advancements have been made in the application of X-ray tomography in materials R&D and testing. In particular the investigation of heterogeneous structures with features in the range of 10^{-6} to 10^{-3} m is profiting from such non-destructive tool box. It is now recognized that X-ray tomography offers a very high potential for application on active or irradiated structures. For many nuclear materials, the detection of pores and cracks is essential in order to understand the irradiation behaviour of the material. For example, within a fusion ceramic tritium breeder pebble bed, the location and fragmentation of pebbles due to burn-up of ^6Li could be studied. Other examples of nuclear and active applications of computerised XRT are the porosity and crack distributions in graphite, delamination in composites and kernel distribution in HTR fuels. Also ceramography/metallography could benefit from XRT, e.g. cutting of materials at the region of interest.

In this paper, examples of possible hot applications of x-ray tomography will be shown. In addition some ideas are given on the possibilities to install XRT equipment in a hot environment. Also the complications due to gamma radiation from the irradiated materials will be discussed.

KEYWORDS **X-RAY TOMOGRAPHY, POROSITY, MICROSCOPY**



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