

Thermal NDT – Historical milestones, state-of-the-art and trends

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The first practical attempts of sensing our world in the infrared spectrum were undertaken in the 19th century. One of the first implementations of the active thermal nondestructive testing (TNDT) was the inspection of Polaris rocket motor cases in 1965 but by the end of the 1970s applications of IR thermography inspired by successful developments of IR technology in military were still rather qualitative thus preventing the progressive competition of TNDT with other inspection techniques. A new level of TNDT was achieved after the wider use of elements of the heat conduction theory. Nowadays, IR thermographic diagnostics and TNDT represent a mature high-technology field which combines achievements in the understanding of heat conduction, material science, IR technology and computer data processing. The high interest to the IR/thermal inspection technique is related to its universal character, high testing productivity and in-service safety. The purpose of this review is to briefly review the basics of TNDT, which include elements of many disciplines of science and technology, such as heat conduction, IR engineering, optoelectronics, image processing and statistics.

This paper was published in the QIRT Journal 11.1