

论文

基于超声红外技术对金属管内壁缺陷的检测

邢春飞¹;李艳红²;陈大鹏¹;邹鹏¹;陶宁¹;张存林¹

1.首都师范大学物理系,北京100048; 2.北京理工大学信息科学技术学院光电工程系,北京100081

摘要:

为提高管道的运送效率,及时检测排除管道内壁的缺陷非常重要。提出利用超声红外无损检测方法对管道内部进行检测。超声主动热激励试件,高频红外热像仪记录试件表面温度变化,结合了超声摩擦生热和红外热成像的优点。对壁厚约为3.3mm检测难度较大的金属管内壁缺陷进行了检测。通过对采集数据和热图的处理分析,准确快速地确定缺陷所在的位置。实物对比分析表明:超声热激励红外无损检测技术可以对金属管道内壁缺陷进行准确检测定位。

关键词: 金属管;无损检测;超声激励;红外探测;内壁缺陷

Ultrasonic infrared technology for checking inner wall of metal pipeline

XING Chun-fei¹;LI Yan-hong²;CHEN Da-peng¹;ZOU Peng¹;TAO Ning¹;ZHANG Cun-lin¹

1.Department of Physics, Capital Normal University, Beijing 100048, China;

2.College of Information Science Technology, Beijing Institute of Technology, Beijing 100081, China

Abstract:

Defect detection and elimination inside the wall of metal pipeline is very important for efficient transportation. The ultrasonic infrared thermal wave nondestructive test technology was employed to detect defects in metal pipeline. It adopted ultrasonic as a heat source to excite the sample and a high frequency infrared camera as a detector to capture the surface temperature, which combined the advantages of ultrasonic heating and infrared thermal technology. The pipeline with wall thickness of 3.33mm was inspected by this technology. By analyzing the temperature signal and typical time thermograph, the effective flaw information was obtained. Experiment conclusively indicates that the position of the defects on the inner wall can be accurately detected by the ultrasonic infrared nondestructive test technology.

Keywords: metal pipeline; nondestructive test; ultrasonic heating; infrared test; inner wall defect

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通讯作者: 邢春飞(1983-),男,山东冠县人,在读硕士,主要从事红外与太赫兹无损检测工作。

作者简介:

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