

Towards a Reliable Method for Automated Thermography Welds Inspection: Algorithms for False Positives Discarding

Raquel Fuente^{C,S}, Aitor García de la Yedra, Ane Beizama and Erik Fernández
Dept. of Control and Evaluation, IK4 LORTEK Research Centre, Ordizia, Spain
rfuente@lortek.es

Non Destructive Testing (NDT) by Infrared Thermography is one of the most promising techniques for replacing traditional operator-dependent NDTs such as Liquid Penetrant, Magnetic Particles or Visual Inspection. This fast and noncontact technique is one of the most suitable ones to be automated for working under difficult or extreme conditions, where the presence of an operator might be unsafe. Nevertheless, evaluation strategies developed up to now reveal that clear discarding between real defects and false positives remains still a challenge. In this work the problem of false positives identification when inspecting welds is addressed. Welds inspection becomes crucial to assure safety in critical applications since surface breaking cracks could grow rapidly under high load or temperature conditions. A thermographic system with a continuous laser line excitation inspects automatically the weld joints in order to detect surface breaking defects. When usual spatial processing techniques are applied, defects may be identified. But in addition to them, indications referring to emissivity variations, i.e., surface heterogeneities and/or contamination (among others) are also found. Here, various spatial and temporal algorithms have been combined and applied to accurately discard false positives from real defects when inspecting welds. Therefore, the feasibility of automated Infrared Thermography inspection for replacing traditional operator-dependent techniques is proved.