

# **Verification Of The Infrared Thermography As A Testing Method For Resistance Spot Welds**

**Lucie Forejtova<sup>1</sup>, Tomas Zavadil<sup>2</sup>, Ladislav Kolařík<sup>3</sup>, Marie Kolaříková<sup>1</sup>, Jan Sova<sup>4</sup>**

<sup>1</sup>Faculty of Mechanical Engineering, Czech Technical University in Prague, Czech Republic, <sup>1</sup>Services Department, ATG (Advanced Technology Group), Czech Republic, <sup>1</sup>Faculty of Mechanical Engineering, Ltd., Czech Republic, <sup>1</sup>Technology, Czech Technical University in Prague, Czech Republic

Resistance spot welding is one of the most frequently used joining technologies of thin deep-drawn sheets frequently used in the automotive industry. Currently there is no universal NDT method capable to inspect the resistance spot welds thoroughly and provide complex assessment of their condition. Conventional NDT methods are basically limited only to the ultrasonic testing and visual testing with only partially reliable outcomes. One of potentially promising methods is infrared thermography. This article is dealing with online thermography testing that is capable to assess the acceptance of the weld joint immediately after welding process. For correct assessment it is necessary to know the emissivity of tested sheet and the electrode tips. Evaluation is based on comparative analysis of a database of hundreds of thermographs of acceptable and non-acceptable resistance spot welds. Maximal and minimal temperature and all detected deviations from the acceptable conditions are uploaded to the software and processed via a specially designed algorithm that divides the welds into acceptable and non-acceptable. The experiments demonstrated that the thermographic testing is suitable for detection of non-acceptable resistance spot welds, usually caused by deviations in one of the primary welding parameters of the resistance spot welding, i.e. electric current, force and the welding time.