



> press release

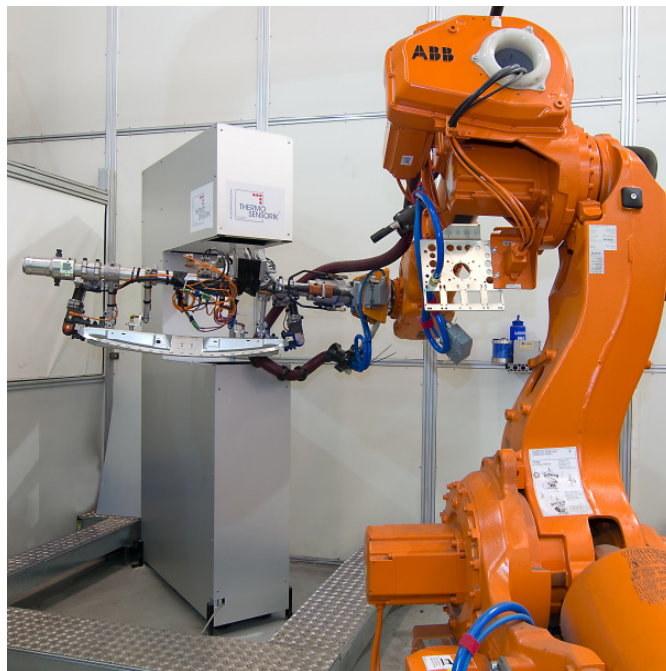


Photo:
Thermosensorik GmbH.
By courtesy of
Gestamp Automoción,
Spain

Thermosensorik fully automated laser weld seam testing technology makes public debut

Erlangen, 10 June 2008 – Thermosensorik GmbH today announced the first public showing of its test method for the fully automated verification of laser weld seams. The heat flow thermography specialist from Erlangen, Germany, is demonstrating the non-destructive testing of laser weld seams on a mass-produced chassis component at the Automatica trade fair (Hall B2, Stand 109) in Munich, which runs from 10-13 June 2008. The patented, fully-automated Thermosensorik method tests up to 60 laser weld seams a minute.

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The heat flux thermography technique uses infrared thermal imaging cameras to analyse the internal structure of components beneath the material surface. The principle behind the technique is easily explained. A component is heated locally to create a temperature gradient and this in turn produces a heat flow through the internal structure to be analysed. The change in temperature over time, which is a direct effect of the heat flow through the component, is then tracked with a high-resolution infrared camera. The resulting sequence of infrared images (the “thermal video”) is evaluated using image processing algorithms and condensed to produce an objective test result.

The automotive industry has been looking for a genuinely efficient and cost-effective method of testing laser weld seams ever since it began using laser welding in the manufacture of vehicle bodies, but has previously had to make do with inferior substitutes such as manual random sampling, in which laser-welded chassis components are broken apart using a hammer and chisel (the “chisel test”) and the broken weld seams are then examined to provide a rough assessment of the quality of the welding processes. After several years of development and successful trialling of the new heat flux testing technique with car manufacturers and suppliers, Thermosensorik GmbH can now confirm a breakthrough: a non-destructive alternative to the chisel test has finally arrived. The new test method, which is sufficiently fast and accurate to test up to 100% of laser-welded chassis components, takes advantage of the fact that any welded joint with sufficient mechanical stability will also exhibit correspondingly good thermal conductivity and hence a high rate of heat flow.

Thermosensorik systems for testing laser weld seams employ a powerful flash device, which quickly raises the temperature of the components to be tested by a few degrees, and a high-resolution Thermosensorik infrared camera, which can capture temperature differences of around 0.01 °C even in harsh production environments. The test is carried out using a robotic unit either to position the specimen between a fixed flash device and infrared camera or to move the flash device and infrared camera into position relative to a fixed component depending on the requirements and production conditions of the automotive manufacturer or supplier concerned. The test throughput depends on the geometry of the component, but the test systems constructed to date are capable of testing up to 60 laser weld seams a minute.

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Thermosensorik's testing technology verifies laser weld seams without ever coming into contact with the component and with no need for direct operator intervention. The fully automated process detects variations from the defined weld quality, such as failure to bond, incorrect seam lengths, blowholes, pores and notches, and assigns them to the appropriate fault category.

These various features add up to give Thermosensorik GmbH laser weld seam testing a significant edge over the "chisel test": avoiding test waste reduces costs; the ability to test up to 60 laser weld seams a minute saves time; objective, documentable test results enhance test quality; early detection of bonding failures minimizes scrap; fully automated testing improves quality of work (allowing activities such as manual testing with hammer and chisel to be eliminated); and boosting the test sample size up to 100% increases the overall efficacy of testing. Using the test systems to facilitate a 100% testing regime, moreover, can deliver additional gains in product quality in the form of fully documented test results and component traceability.

"After many years of research and development, some of it initially funded by research contracts from the German Federal Ministry of Education and Research, and our first successful installations at pilot customers, our technology is now ready for the rigours of product testing in real industrial production environments," said Manfred Böhm, Head of Technology at Thermosensorik GmbH.

"We are excited to have the opportunity to present our fully automated laser weld seam testing method to the public now that the fundamental patents have been granted," adds Dr Christoph Döttinger, Head of Sales and Marketing at Thermosensorik GmbH. "We will be testing a chassis component of a mass-produced vehicle live on our stand at Automatica to demonstrate the power and capabilities of our technology."

"Only by thoroughly mastering the entire technology chain have we been able to bring this innovation into the world," said Thomas Hierl, CEO of Thermosensorik GmbH. "The system we are presenting today represents the successful synthesis of our expertise across a range of fields, from high-resolution infrared cameras to robot control and automation technology to the real-time processing of 16-Bit infrared image sequences."

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About Thermosensorik GmbH

Thermosensorik GmbH was founded in 1998 as a spin-off from the University of Erlangen-Nuremberg. It is one of the true pioneers of image-based heat flux analysis and has made a highly significant contribution to the development of this new technology for non-destructive material and component testing. Today Thermosensorik's product range encompasses high-resolution infrared system cameras, manual test systems for the laboratory and fully automated test systems that integrate smoothly into production flows for non-destructive detection of cracks, cavities, delamination, defective joints and the like and image-based layer and wall thickness measurement.

Thermosensorik GmbH currently has more than 30 highly qualified employees and a dense network of highly capable suppliers. Well over 100 installations in research institutions and industry underline the abilities of Thermosensorik GmbH products on a daily basis. Thermosensorik test systems for non-destructive testing in industrial-scale production are already in use at several of Germany's large car manufacturers as well as a number of turbine producers.

Thermosensorik GmbH won the Nuremberg Chamber of Commerce and Industry's Start-Up Prize in 2003. In 2006, Siemens AG acquired a minority interest in Thermosensorik GmbH via its Siemens Venture Capital GmbH and Siemens Technology Accelerator GmbH subsidiaries. The German Patent and Trade Mark Office (DPMA) granted Thermosensorik GmbH a number of patents for the fully automated testing of welded joints in 2007 and 2008.

Further information may be found at: www.thermosensorik.de

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