



Quality Control Of Aluminium Laser-welded Assemblies

EU Funded Project
Ref. 260153

• Goals of the project

- To develop a new laser processing system for welding of thin-gauge aluminium and copper, with integrated process monitoring and in-line non-destructive inspection.
- To provide a reliable, high-speed, low-cost and high-quality joining solution for electric car battery and thin-film photovoltaic cell interconnections.

For more information visit:
www.qcoala.eu

QCOALA Technologies

Integrated laser system

Laser system

Development of laser source and optical delivery

Intelligent processing

Development of welding procedures for the welding of 0.1-1.0mm Al and Cu

Monitoring

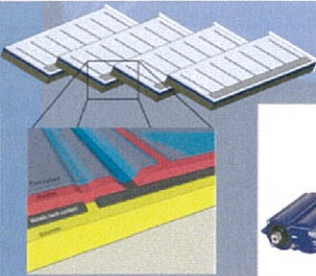
In-process monitoring of Al and Cu welding

Weld Inspection

Development of inspection technology for 0.1-1.0mm Al and Cu

Battery & Solar panel application

End Applications:
Solar energy - Automotive



PROJECT CO-ORDINATOR

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Computerised
Information
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solarpro



VOLKSWAGEN
ARTIFIZIELLE GESELLSCHAFT

LASAG
INDUSTRIAL-LASERS



QCOALA

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Project Partners

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- Fraunhofer-Gesellschaft zur Foerderung der Angewandten Forschung E.V (ILT), DE
- FLISOM AG, CH
- LASAG AG, CH
- PRECITEC KG, DE
- Computerised Information Technology Ltd (CIT), UK
- Societe d'assemblages par Faisceaux d'Electrons et Laser (SAFEL), FR
- Solarpro EAD, BG
- VOLKSWAGEN AG, DE

Vision & Aim

The QCOALA project will develop a new dual-wavelength laser processing system for welding thin-gauge aluminium and copper, 0.1mm to 1.0mm in thickness, with integrated process monitoring and in-line non-destructive inspection, and establish its capability to provide a reliable, high-speed, low-cost and high-quality joining solution for electric car battery and thin-film photovoltaic (PV) cell interconnections.

Through fully integrated process ICT and Statistical Process Control (SPC), the new system will facilitate in-line quality control, as well as a higher level of automation in manufacturing, and thereby achieve higher yield and throughput, for both these high-in-demand applications. This project will help the Beneficiaries, with expertise in the constituent components of the new system, to increase their annual turnover between 15 and 25%, their productivity between 50% and 100% and their yield between 2 and 10%.

The new laser processing system will be based on a pulsed platform, capable of laser pulses in the range of μ s to ms and pulse energies of up to (tens of) Joules, and capable of generating both the near-IR and green wavelength through a dual-wavelength beam scanner. Real-time temporal pulse control will be developed to allow closed-loop control of the monitored process. The fully-integrated system will produce 100% inspection rate, with a 'fingerprint' of each laser weld captured in 'real-time', and allow in-line process control when welding car battery and thin-film PV cell interconnections.

QCOALA is focused on energy-efficient, environmental-friendly and agile manufacturing, through the feed-back of in-line-monitoring and inspection information into the production line, allowing process control and continuous quality improvement and waste reduction. Whereas the concept of the project is aimed at smarter and more energy-efficient manufacturing, the applications that are addressed in the project are categorised in the 'green' alternative energy market.