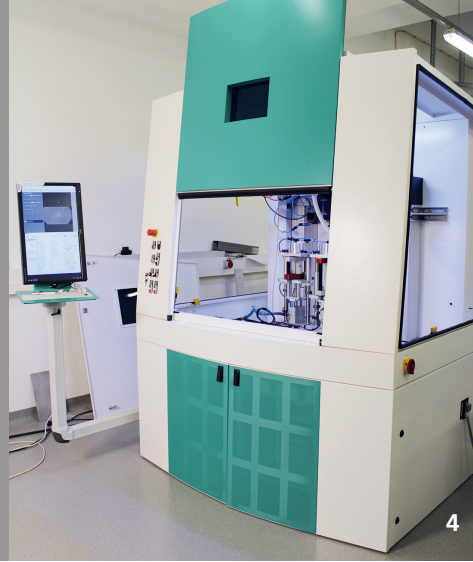


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LASER WELDING PLANT FOR THE PRODUCTION OF LARGE LITHIUM-ION BATTERY CELLS

Task

To produce large round lithium battery cells, the industry has to join cell poles to cell windings and create a conductive connection. This requires a laser welding cell that can be used to produce in small series. The aim of the work presented here was to develop a particularly flexible system technology that allows variable weld seam geometries and is suitable for different metallic materials.

Method

Initially, Fraunhofer ILT carried out feasibility and process development studies of the welding tasks. From the results of these studies, it derived the requirements for the system technology. The necessary components were then assembled at Fraunhofer ILT and the complete system for semi-automatic process control was tested; afterwards the system was delivered.

Results

The laser welding system developed for the production of large round cells has already been delivered to a customer, installed on site and commissioned together with the operators. Since then, several small series have already been successfully produced on the system.

With the support of Fraunhofer ILT, an additional laser welding process was developed to produce a safety component, which is additively welded to the battery cell within the overall system. Thus, the portfolio of laser welding tasks could be extended thanks to the high system flexibility. The institute is already planning to develop and implement further welding tasks.

Applications

The laser welding system is suitable for joining metallic materials. This also includes non-ferrous metals and precious metals.

The large round cells currently produced with the laser welding plant are mainly used in the automotive and aerospace sectors. However, this area shall be significantly expanded, for example to include maritime applications.

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3 Large round cell, © EAS Batteries GmbH.

4 Process plant for welding large round cells.