

Which welding methods are used in the production of battery applications?

The compared techniques are resistance spot welding, laser beam welding and ultrasonic welding. The performance was evaluated in terms of numerous factors such as production cost, degree of automation and weld quality. All three methods are tried and proven to function in the production of battery applications.

How to evaluate power batteries after welding?

At present, most of the post-welding quality evaluation of power batteries is mainly carried out by manual visual inspection, which is bound to cause low detection efficiency and high labor costs, making it difficult to meet the requirements of modern welding production for high efficiency and high quality.

Do high-volume production requirements affect welding performance in battery assembly?

Moreover, the high-volume production requirements, meaning the high number of joints per module/BP, increase the absolute number of defects. The first part of this study focuses on associating the challenges of welding application in battery assembly with the key performance indicators of the joints.

What is quality assurance for battery welding applications?

The quality assurance for battery welding applications is still in its infancy. Commercial solutions exist, but dedicated solutions are based on end-of-line approaches, while online solutions tend to address the generic quality issues of a specific welding process.

Is there a quality assurance approach for laser welding?

Of course, if someone looks beyond the battery welding applications many in-process quality assurance approaches are available for welding. In the case of laser welding, the in-process monitoring is mainly based on imaging, acoustic emission, and E/M signal techniques in general.

What is process optimisation in battery welding?

Process optimisation is by far the most researched area of quality assurance for battery welding applications. Most of the studies have been carried out either as pure experimental investigations to find the process parameters that optimise one or more KPIs of a joint, suppress defects, or validate a process model.

This paper presents quality testing of battery pack welds for different welding time parameters of an automatic resistance spot welding machine. Several quality testing methods commonly...

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AI-based methods for monitoring contact welds on batteries. In the system under investigation, a photo diode

captures the process radiation emitted by the interaction zone during welding. Although they aim to develop a precise quality assurance system, classical approaches to interpreting sensor

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Infrared imaging allows for non-destructive testing of battery welds, ensuring high-quality and reliable connections without compromising the battery's integrity. By identifying and addressing weld defects, infrared inspection minimizes the risk of battery failure, electrical malfunctions, or safety hazards caused by faulty welds.

Common problems and repair methods of lithium battery welding. Insufficient strength of welding workpiece: it may be due to incorrect welding parameters or welding material quality problems. You can adjust lithium battery welding parameters, such as welding time, current and voltage, and ensure that high-quality welding materials are used.

Keywords: Sheet Metal Joining, Resistance Spot Welding; Quality Assessment Techniques Introduction Resistance Spot Welding (RSW) is commonly chosen for high volume sheet metal joining processes due to the high speed at which strong joints can be created. RSW can be used to join a number of different sheet metal materials ranging from all types of steel, ...

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Quality of laser welding is directly related to the overall performance, yield rate, and service life of the battery. Pseudo Welding (PW) defects are encountered between the poles of the PB and busbar during welding, which can be attributed to the existence of foreign objects or process parameters and other factors [3]. The occurrence of PW could seriously affect the ...

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This study presents a straightforward yet highly accurate method for evaluating laser welding quality using only image data, achieving an accuracy of up to 98%. This value ...

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