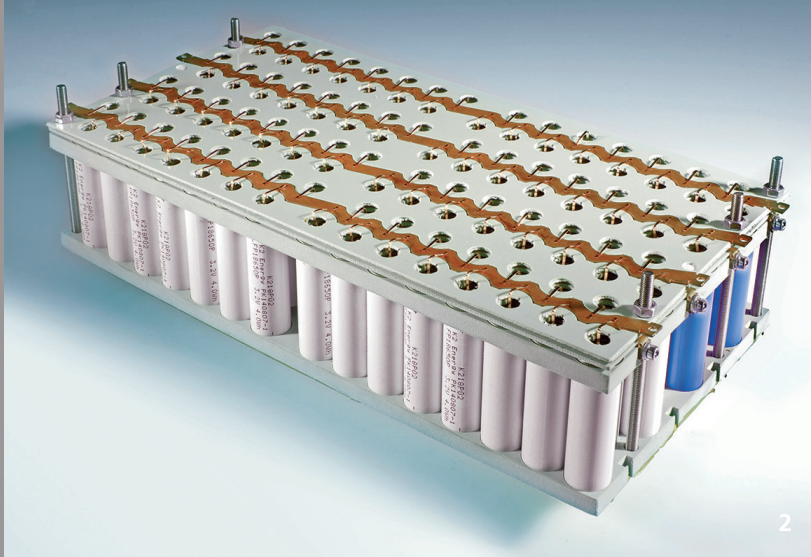




AUTOMATED LASER BONDING OF BATTERY CELLS

Task

For electromobility, individual battery cells are often combined to form powerful energy storage systems. As the demand for corresponding battery modules increases, their production time needs to drop and, consequently, the degree of automation has to rise. Due to their high availability, round cells (type 18650) are frequently used in industry today. To achieve the necessary specifications of a battery module, a large number of cells are interconnected. This requires a joining process with a high level of automation and high process stability.

Method

Laser bonding can constitute a connection technique for the cohesive contacting of battery cells. As part of the research project »RoBE« (Robust Bonds in Electric Vehicles), a corresponding bonding machine was developed and set up. Instead of conventional ultrasonic bonding, metal strips (aluminum or copper) are joined using a laser-beam welding process. The laser bonder combines the high degree of automation of a conventional ribbon bonder with the ability of the laser beam welding process to join copper and aluminum materials. The use of larger sized ribbon geometries compared to ultrasonic bonding enables the provision of necessary conductive cross sections.

Results

The laser bonder with the laser-beam welding process is capable of automatically and reproducibly connecting 18650 type round cells with copper conductors. Only the accessibility from one side is required because the laser bonder is positioned on the negatively polarized bead of the cell.

Applications

In addition to contacting round cells, the developed process and machine technology can be used for other types of cells as well as in power electronics.

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2 Laser bonding of positive and negative pole at the top of round cells.