Laser welding of nickel sheets for new energy batteries

Why was laser welding used to join nickel sheets?
Laser welding was used to join nickel sheets because it is a non-contact process,which can produce high precision welds and has shorter cycle time. The orientation of the nickel sheet during laser welding was the same as in resistance spot welding.

What is the orientation of nickel sheet during laser welding?
The orientation of the nickel sheet during laser welding was the same as in resistance spot welding. It was found that the sample welded using laser welding has three layers of circles as resulted in Fig. 51.3 d.

Can laser welding be used for electric vehicle battery manufacturing?
There are many parts that need to be connected in the battery system, and welding is often the most effective and reliable connection method. Laser welding has the advantages of non-contact, high energy density, accurate heat input control, and easy automation, which is considered to be the ideal choice for electric vehicle battery manufacturing.

Can a nickel joint be welded using laser welding?
It was found that using the parameters discussed,the joining of two similar nickel was successfully achievedvia these welding methods. The results show that the material joints fabricated using laser welding had the highest average stress value of 155.86 MPa,whereas the average for nickel joints of resistance spot welding was 122.25 MPa.

Can nickel joint be used for EV battery development?
In this study,the joint ability of two different joining techniques,namely resistance spot welding and laser welding of nickel weld interfaces and joint microstructure were addressed. Similar materials of nickel joint were used to investigate the parallel connection of tab cellsfor electric vehicle (EV) battery development.

What is laser welding?
4. Summary and Outlook Laser welding is a welding method with high energy density and non-contact and accurate heat input control,which can provide reliable weldability for the welding between dissimilar materials in the battery system of electric vehicles.

Compared to the resistance spot welding process, laser welding produced a better weld interface, which contributes to a higher strength value. EV batteries consist of ...

The battery technology currently in use is lithium ion batteries because these are smaller and lighter than current automotive power batteries (generally, Nickel Metal Hydride). This technology can provide power equivalent to current technology at a smaller size and lighter weight, or more power at an equivalent size and

weight. The batteries used in the electric ...

With the rapid development of aerospace, energy power, petrochemical, and other fields, nickel-based alloy sheet welding technology has become one of the key factors determining the performance of core ...

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A study of weld joints of nonferrous, Nickel 201 alloy sheets using a new generation disk laser as the green welding technology for effective manufacturing was carried ...

Laser welding has the advantages of non-contact, high energy density, accurate heat input control, and easy automation, which is considered to be the ideal choice for electric ...

This study evaluated, laser wobble welding of a nickel-plated Al busbar of 0.9 mm thickness with a 0.3 mm thin 21700 cell nickel-plated steel terminal. An optimised joint using the wobbling method is implemented for the direct application to battery packs, satisfying the ...

Discover the future of lithium-ion battery manufacturing with the battery laser welding for 2023. Elevate your manufacturing processes with its precision, efficiency, and versatility in the new energy battery production.

This research study examines the impact of variations in nickel plating thickness on the laser welding of copper busbars (C11000 alloy) that are coated with electrolytic nickel plating and 21700 dummy cells composed of hilumin.

Here, we reveal the effects of surface pretreatment conditions and the amount of filler, along with the laser power and irradiation time on the characteristics of laser-soldered joints, by simultaneously evaluating the electrical and mechanical behavior of laser-soldered nickel-plated steel sheets (Hilumin®). By describing the morphological characteristics of the ...

Therefore, this study aims to investigate the effect of low-cost laser technology on welding the dissimilar materials of battery case and tab for lithiumion batteries. In the present experiment, ...

In this research, Al/Cu thicker plates are overlap-joined based on an experimental simulation to improve the metallurgical quality of laser welding the busbar tab to interconnect plate in manufacturing production for electric vehicle battery.

This paper introduces the research progress of laser welding technology of nickel base alloy sheet, and summarizes the evolution of weld microstructure, changes of mechanical properties and corrosion resistance, and the rules of welding deformation under two kinds of welding technologies including laser autogenous

welding and laser ...

Compared to the resistance spot welding process, laser welding produced a better weld interface, which contributes to a higher strength value. EV batteries consist of battery cells arranged in large numbers in series or parallel. It is important to ensure that optimal power and energy capacity can be supplied to electric vehicles [1].

Therefore, this study aims to investigate the effect of low-cost laser technology on welding the dissimilar materials of battery case and tab for lithiumion batteries. In the present experiment, the nanosecond fiber laser source is applied to join the thin aluminum alloy tab and nickel-plated steel battery case, the result then is analyzed in ...

Novel lasers with lower wavelengths and higher power including blue laser (wavelength~450 nm) and green laser (wavelength~515 nm) systems have been introduced in recent years with much higher energy absorption on highly reflective materials such as copper and aluminum which are widely used as battery tabs or busbars. However, these laser ...

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