ISABELLENHÜTTE

CUSTOMIZED PRECISION WELDING HELPS OEMS SOURCE HIGH-PERFORMANCE BUS BAR ASSEMBLIES

One company brings 500 years of alloys experience to challenging metallurgical pairings

As EV designers and other battery-power innovators continue to push the envelope in power, precision, and durability, greater demands are being placed on the "backbone" of these systems: the bus bar.

For OEMs who require Battery disconnect units (BDUs) and Power Distribution Units (PDUs), significant efficiency and performance gains are being pursued by tapping experts to create customized assemblies, streamlining their processes, boosting reliability, and reducing their vendor/supplier count.

In the latest concept vehicles, multi-alloy bus bars—created as a single unit and as long as one meter—are being custom fabricated by welding aluminum and copper. This answers the need for increasing capacity, conductivity and safety along with the durability of welded assemblies. Combining these dissimilar materials requires deep knowledge, to extend and refine designs based on the unique properties of exotic finely tuned alloys.

Why Isabellenhütte

Isabellenhütte is a midsize German company that is flexible, specializes in custom solutions and has long standing experience with shunt resistors. Isabellenhütte's 500-year legacy as expert metal smelters and fabricators are unmatched. Today, the company's alloys—and precision components made from them—are in-use around the world and into the far reaches of space.

They manufacture copper bus bars for a variety of customers using different plating's, shapes, and elements such as press-in nuts or studs.

The capabilities

Today, the Isabellenhütte team can create custom bus bars for customers using the latest innovative welding methods methods, resulting in new capabilities and options that reliably withstand heavy-duty usage and extreme environments. Welding connections help avoid many of the common pitfalls of mixed-alloy bus bar construction (e.g. blowholes) while providing excellent conductivity and meeting weight, cost, and footprint goals.

Isabellenhütte is one of the few companies in the industry that has successfully conducted long-term testing on copper/aluminum bus bar assemblies using innovative welding methods. They are currently working on large commercial EV projects for several leading automakers.

Expertise in both alloys and precision measurement is a powerful advantage (unique to Isabellenhütte) in designing innovative/integrated bus bar assemblies. The company leverages a large portfolio of components to provide a complete solution for their customers' BDU/PDU designs. Isabellenhütte can deliver bus bars, the current sensors or shunt resistors, contactors and pre-charge resistors for example.

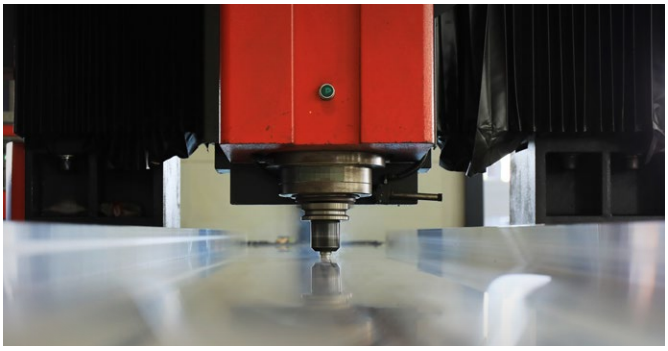
They are expanding their portfolio with products that cover isolation monitoring, ignition circuit, relay/contactor control. Beyond custom welding/fabrication, Isabellenhütte can also provide testing services at their state-of-the-art facilities in Germany.

The benefits

For companies looking to impact issues like vibration testing, welded bus bar solutions can go a long way in creating meaningful improvements. Eliminating mechanical fasteners reduces potential points of failure, saves manufacturing time/labor, and can reduce the number of suppliers for OEMs/EV makers.

Welded assemblies also reduce the risk of overheating in joint connections. Proper preparation, such as surface cleaning, correct joint design, and appropriate welding parameters, is critical for achieving a strong, reliable connection with minimal resistance.

Isabellenhütte is a pioneer in innovative bus bar welding and design, with advanced capabilities for alloy sourcing/creation, backed by experienced teams of engineers and fabricators.



Our proprietary joining technologies enables robust connections between dissimilar materials such as aluminum and copper. The process delivers consistent, high-integrity bonds with optimized electrical and mechanical performance, even in demanding applications.

For further information:

Isabellenhütte's experts are happy to work with their customers to brainstorm optimal bus bar solutions.