

Application example

120 mm² aluminium cable on an aluminium conductor rail

PLASTIC WELDING

METAL WELDING

CUTTING

CLEANING

SCREENING



Task

Due to the pricing developments on the copper market, aluminium is increasingly being used as an alternative for high-voltage applications. In order to conduct power from the battery at the back of the vehicle into the engine compartment, an aluminium conductor rail running through the body has to be connected to a 120 mm² aluminium cable. The connection quality has to be monitored in the production process while process data needs to be stored. Low line and conduction losses play an important role, which is why the connection's electrical contact resistance must be as low as possible.

Solution

To ensure good electrical conductivity when connecting aluminium, the oxide layer first has to be broken down – when using ultrasonics, the results of this process are outstanding thanks to the high frequency oscillations. Welding aluminium with a larger cross section of up to 200 mm² requires a great deal of power, which is why this application is welded with the MT8000 PowerWheel® system with sound protection casing accessible from three sides. The results of the welding process are checked with the TCS5 controller with convenient touchscreen operation.

Configuration advantages

The torsional PowerWheel® technology can output power of up to 10 kW, meaning it is often used for large wire cross-sections that require higher levels of power. Thanks to its hallmark torsional oscillation mode, the welding width can be reduced by up to 30% in contrast to conventional ultrasonic welding solutions, which can be useful when construction space is limited. The TCS5 process controller allows for comprehensive quality monitoring by enabling you to set parameter limits. All data is stored and can be analysed statistically if necessary. PowerWheel® components can be integrated seamlessly into production lines.



The application was created using a 10 kW MT8000 PowerWheel® system, retractable sound protector and TCS5 welding process control.