

Press Release

Application: Aluminium Cable in Tubular Cable Lug

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Telsonic PowerWheel® welds and crimps aluminium cable securely in tubular cable lug

Aluminium cables are used more and more in automotive on-board power supply systems

(Erlangen) An aluminium cable with a large cross-section is to be securely welded and crimped at the same time in a thick-walled tubular cable lug made of copper. What could not be solved by means of conventional processes can now be realised reliably with the PowerWheel® technology of Telsonic AG. With a high application of energy within a short time, the revolutionary ultrasonic welding process connects the aluminium cable with the copper contact. Furthermore, the tubular cable lug can be sealed securely by means of heat shrinkable tubing so that it is ensured that the material does not tear. This means that the ultrasonic welding or crimping technology established for copper-to-copper joints is now also available for aluminium-to-copper joints.

"Since we apply large amounts of energy to the joint zone in a highly concentrated manner within the shortest time using the PowerWheel® technology, we achieve a welded joint between the different materials that is closed by adhesive force," explains Axel Schneider, Sales Manager of the Swiss company TELSONIC AG. The procedure with the revolutionary PowerWheel® process with its unusual movement pattern results in a joint closed by adhesive force where only a positive fit is achieved using other processes. An on-board power supply system manufacturer can thus produce other connection cables in weight-saving aluminium without having to compromise on secure contacts.

Securely contacting weight-saving aluminium

In this case, an aluminium cable with a cross-section of 85 mm² in a tubular cable lug with a wall thickness of 2.0 mm is securely welded and crimped at the same time in one and the same process in one and the same system. "Up to now, this has not been possible with other known processes," says the user. Aluminium can also be crimped, but its physical properties are an obstacle to this. The challenge is to tear open the oxide layer and to achieve a joint closed by adhesive force. For small cross-sections (< 6 mm²), this is possible with high quality requirements for the components. With the ultrasonic process, however, this can be realised much easier and more reliable.

And for large cross-sections, this is even only possible with the new process.

The ultrasonic technology tears open the oxide layer even in the case of large aluminium cross-sections, achieves a

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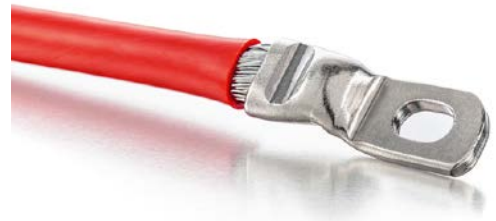
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welded joint closed by adhesive force, reduces the crimping forces by a multiple and produces a reliable low-resistance joint. In this way, more and more tubular cable lugs are welded with the new crimp welding using ultrasonics in the automotive sector in particular. The field of application ranges from 10 mm² to 160 mm², "but this does not mean that the end of the road has been reached yet," says the user.

With the PowerWheel® process, the user creates strong, secure contacts by combining an ultrasonic welding process with a crimping process. Due to the sonotrode design and the rolling welding movement, a welding pressure of up to 10 kN and an energy output of up to 13 kW are applied to two positions in the joint zone through the thick walls of the tubular cable lug within a very short time. "The thick walls in particular require a high application of energy," says the user, making clear how great the challenge is. However, the aluminium does not flow away, but connects with the copper-to-nickel joint that is closed by adhesive force. This results in a secure, very strong weld which allows the current flow in the required capacity. The user can thus realise further areas of power supply in automotive on-board power supply systems with weight-saving aluminium cables and obtains a competitive advantage.

More information about the POWERWHEEL® technology you will find here:

[PowerWheel®](#)



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Image cable lug