

Laser Technology for E-mobility



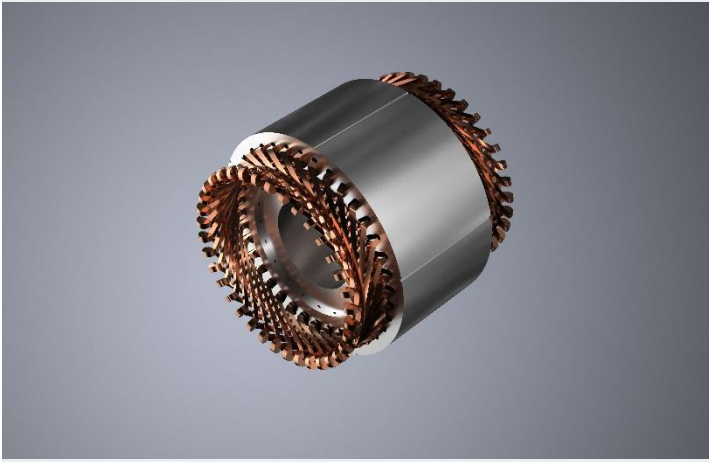
Lightweight
Body design of
entire vehicle

Battery
Modules &
Terminal
Welding

Copper &
Aluminum
Bi-Metal joints

Deep -
penetration
welds for
power train

All types of
Welds for E-
Mobility



Lasers for production of electric vehicles

Laser technology is an ideal production method – in the manufacture of powerful fast-loading batteries for electric motors as well as in the production of other electric-motor components.

Efficient battery production

Battery housings as well as cell connectors are welded with the laser. Contact-free operation means that the material is not subjected to mechanical stress. Heat input is minimal and local, guaranteeing distortion-free seams. TRUMPF lasers create high-quality weld seams and work with extreme precision. This enables ever smaller and more powerful cells to be successfully integrated into one battery block. Efficient fabrication on laser machines with high productivity and low part costs enable high-volume production at highly favorable prices.

Potential for future applications

The examples shown are only a few of the possible laser technology applications for the production of electric vehicles. As electro-mobility grows more widespread, additional new fields will open up. TRUMPF offers an extensive range of lasers and laser systems for economically efficient solutions: from solid-state lasers and CO₂ lasers to marking lasers. The product range also includes 2D laser machines such as those used for cutting thin sheet metal, like aluminum and copper, as well as laser systems for 3D processing.

Benefits of the laser at a glance.

- 1 Efficient, economical production.
- 2 High precision and repeatability.
- 3 High processing quality.
- 4 Distortion-free weld seams.

Precision components for electric motors

In the electric motor sector, the laser is used for cutting stator laminations. Filigree contours can be cut very quickly, warp-free and with high repeatability – decisive factors in welding of stator laminations.

E-drives: Hairpin welding

In order to prepare hairpin welding, TRUMPF short – pulse lasers that ablate the layer of insulating paint, without damaging the copper underneath it. The results of process are more precise than those of mechanical decoating processes. While welding the hairpin, an intelligent sensor system ensures precise seams and top quality. Due to the high level of reproducibility of laser welding processes, our customers achieve consistently high tensile connections with a good level of conductivity – in a high quantity too.