Press release

Energy-efficient laser applications for the e-mobility and battery industry: Laserline at the Battery Show Europe 2024

Focus on high-efficiency diode lasers for battery drying and blue diode lasers for copper processing

Highly efficient laser solutions for industrial material processing in the battery and e-mobility sector - this is the focus of Laserline's presence at the Battery Show Europe 2024. The main topics include new high-efficiency diode lasers for economical and environmentally friendly battery drying and blue diode lasers for the effective processing of copper components for electric drive technology and power electronics.

Mülheim-Kärlich, May 2nd 2024 - Diode laser specialist Laserline is presenting energy-efficient laser applications for industrial material processing in the field of electromobility and battery production at the Battery Show Europe 2024 (June 18 to 20 in Stuttgart, Hall 8, Stand 8-A57). Highlights of the trade fair appearance include the LDF 30,000 DR and LDF 15,000 DR diode lasers - two new high-efficiency laser systems that support a diode laser-based drying process for the efficient, economical and environmentally friendly production of lithium-ion batteries. For the first time, the process enables the production of anodes and cathodes in a roll-to-roll process and thus offers an alternative to the market-dominating convection drying in electricity- or gas-powered continuous ovens. Compared to a conventional GigaFab drying line, it guarantees operating cost savings of 28 percent and halves the required production area, thus representing an important milestone on the way to CO2-neutral and competitive battery cell production.

The two new models in the Laserline LDF series are predestined for area applications thanks to their precise, homogeneous top-hat beam profile with a width of up to 1.4 m and offer output powers of 15 and 30 kW. The lower output class can also be upgraded to 30 kW directly in the field once the process has been successfully established. The new high-efficiency lasers are particularly impressive due to their contribution to reducing process-specific CO2 emissions. With an electrical efficiency of over 50 percent, they consume significantly less energy than conventional industrial lasers and therefore not only reduce operating costs, but also contribute more to climate and environmental protection than any other laser tool.

Laserline will also be providing information about its portfolio of solutions in the field of blue high-power diode lasers at the trade fair stand. One of the main applications is the welding of copper components, for example in electrical drive technology or power electronics. Its wavelength of 445 nm is absorbed by copper and copper alloys ten times better than infrared radiation, which ensures exceptionally smooth weld pools without pore formation. A new application that will be presented for the first time is the ablation of insulation layers on copper conductors using blue lasers. This utilizes the excellent absorption properties of short wavelengths in carbon compounds. The highlight of the product range are the world's first

commercially available blue diode lasers with 4 kW CW output power, which open up new areas of application, such as the deep welding of inverter assemblies. The most compact version of blue high-power diode lasers will be presented at the trade fair stand: The LDM_{blue} lasers are available with CW output powers of up to 2 kW and are particularly easy to integrate into machine and system concepts thanks to their space-saving 19" format (7 U).

With its reduced, adaptable heat input, laser welding is also extremely suitable for industrial material processing tasks as pure laser beam welding or using welding filler materials, such as those used in the production of battery boxes. In addition, the diode laser-based process supports numerous beam shaping options, which can be used to individually adapt the power input to the respective component. This results in strongly reduced hot cracks. An addition of welding filler materials as cold or hot wire will be presented at the trade fair stand, which, in addition to bridging tolerances, offers further advantages such as the optimization of the welding speed and the mechanical-technological properties. Laserline will demonstrate the advantages of the interaction between laser technology and filler metal feeding - such as reduced reworking - using battery box profiles.