Press Release

Battery Show Europe: TRUMPF VCSEL heating system accelerates sustainable battery production

Battery process chain becomes more efficient with VCSEL heating systems thanks to direct heat transmission // More sustainability in Li-battery manufacturing due to compact VCSEL heating modules // High-power infrared laser systems speed up pouch cell sealing up to three times

Ulm, November 24, 2021 – TRUMPF Photonic Components presents its new VCSEL heating solutions for e-mobility at the Battery Show Europe in Stuttgart. The unique VCSEL high-power infrared systems offer benefits for two application fields in the manufacturing of Li-batteries. One is the battery foil drying of batteries, for example for e-cars. The VCSEL heating systems work with infrared radiation which directly transfer the heat to the application without any energy loss. This increases the efficiency of the battery process chain. “E-mobility is targeting one of our main strategic growing business fields for our VCSEL heating systems and we are happy to contribute to the future of mobility with our solutions by enabling more efficient manufacturing”, says Ralph Gudde, VP Marketing and Sales at TRUMPF Photonic Components. Laser-based VCSEL arrays work very fast with directed optical infrared heating, in a defined manner to heat large areas. The VCSEL heating systems need less energy compared to standard ovens and allow a significant reduced footprint of the production system. The active material on the electrode foils can be dried efficiently to keep the solvent content as low as possible.

Longer lifetime of cells

VCSEL heating systems can also extend lifetime of the battery cells, as they avoid wrinkles of the foils with a highly accurate sealing process. This leads to higher quality and homogeneity of the pouch cells, compared to other production methods such as welding with hot bars. Furthermore, a VCSEL heating system is up to three times faster than hot bars. This increase in production speed is possible as the heat for welding is applied inside the pouch foil, close to the weld.

To guarantee that only the foil seam is heated up, the clamping is out of sapphire components. Therefore, high quality welding results are achieved, as the clamping can be opened when the plastic of the foils is already solidified. This avoids defects of the weld seam, compared to other processes where the clamping has to be opened when the plastic is still in liquid state. “Next to standard systems we also develop customized solutions. In our Customer Application Center in Aachen, we do have the infrastructure to run tests and evaluate the right solution with our customers”, says Gudde.

Visit TRUMPF at the Battery Show Europe, hall 4, booth 330

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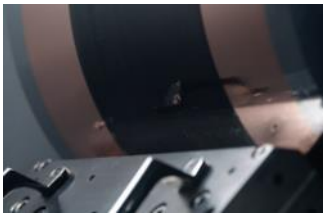
Battery module in TRUMPF production

Laser solutions from TRUMPF for Li-battery manufacturing enable a more efficient production in various process steps.

Clean room facility TRUMPF Photonic Components

The VCSEL laser diodes that are used in the VCSEL heating systems are manufactured in the clean room facility at the headquarter of TRUMPF Photonic Components in Ulm. Assembling of the heating modules takes place in the Customer Application Center in Aachen.



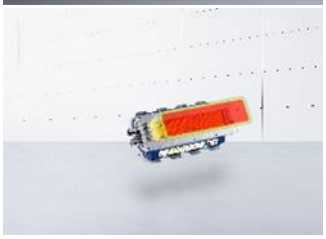
Battery foil drying

At the process step of battery foil drying, VCSEL heating systems efficiently dry the active material on the electrode without any energy loss, thanks to direct heat treatment.

Press Release

Pouch cell

At pouch cell manufacturing VCSEL heating systems achieve higher quality and faster process times at welding the foils.



Heating module

High-power infrared VCSEL heating systems provide scalable power and can be regulated precisely.

About TRUMPF Photonic Components

TRUMPF Photonic Components is a global technology leader, supplying VCSEL and photodiode solutions for consumer electronics, datacom, industrial sensing and heating markets. More than two billion VCSEL chips and photodiodes has been shipped worldwide so far. The employees continue to drive the technological know-how that has been established for over 20 years now in order to maintain its leadership position. The long-established technology was acquired by TRUMPF in 2019. The company has its headquarters in Ulm, Germany, with further sales locations in the Netherlands, China, Korea and the US.

TRUMPF Photonic Components belongs to the TRUMPF Group, a high-technology company that offers production solutions in the machine tool and laser sectors. TRUMPF is the world technological and market leader for machine tools used in flexible sheet metal processing, and also for industrial lasers and metal 3D printing. In 2020/21, the company employed some 14,800 people and generated sales of about 3.5 billion euros. With over 80 subsidiaries, the TRUMPF Group is represented in nearly every European country as well as in North America, South America and Asia. The company has production facilities in Germany, France, the United Kingdom, Italy, Austria, Switzerland, Poland, the Czech Republic, the United States, Mexico and China.

For more information about TRUMPF Photonic Components visit:
www.trumpf.com/s/VCSEL-solutions

Press Release

Press contact:
Anne-Kathrin Hotz
Marketing Communications Manager
+49 731 5501940
Photonic.components@trumpf.com

TRUMPF Photonic Components GmbH, Lise-Meitner-Straße 13, 89081 Ulm, Germany