



Press Release

Battery Show Europe: More sustainable battery manufacturing with VCSEL-based heating solutions

Lower CO2 emissions, smaller footprint, reduced energy loss and higher product quality // More sustainability in lithium-battery manufacturing due to efficient VCSEL heating modules // TruHeat VCSEL heating systems to replace conventional production equipment // Battery foil drying and pouch cell sealing as main application fields

Ulm, May 15, 2023 – TRUMPF Photonic Components is showcasing two manufacturing solutions from its TruHeat VCSEL product series for Li-battery manufacturing at the Battery Show Europe in Stuttgart at Booth 10-H20. The compact VCSEL-based systems generate direct and homogeneous infrared laser light to heat treat surfaces and materials efficiently and with almost no energy loss. “Sustainable manufacturing equipment is more important than ever before. Our TruHeat VCSEL systems require a smaller footprint while being more efficient compared to many conventional production methods,” says Ralph Gudde, Vice President Marketing and Sales at TRUMPF Photonic Components.

Lower CO2 emissions using VCSELs for battery foil drying

One main application field is battery foil drying. The active material on the electrode foils can be dried efficiently and homogeneously, while keeping the solvent content as low as possible. “The largest part of the CO2 emission in battery manufacturing is caused by the drying of the coating on the battery foils. Using our TruHeat VCSEL systems, the energy efficiency is increased by a factor of two or more”, explains Gudde. VCSEL-based heating systems apply the infrared radiation in a direct, controlled, and homogenous manner to the slurry. The systems need less energy compared to standard ovens and allow for a significantly reduced footprint of the overall production system. Utilizing the maintenance friendly, highly reliable TruHeat VCSEL systems, the battery foil drying process is also up to three times faster compared to conventional production.

VCSELs seal pouch cells three times faster

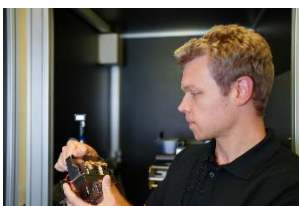


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The second application field is pouch cell sealing. This process is up to three times faster using VCSEL heating systems. The actual sealing time with the direct heat treatments is below one second. The increase in production speed is also enabled because the heat for welding is only applied inside the pouch foil, close to the weld. There is hardly any heat loss or energy waste, as the TruHeat VCSEL systems come with individual emission zones to create targeted heating profiles. The individual emission zones yield an excellent sealing quality as the power can be adjusted to the dedicated area of the pouch cell. Furthermore, the heating is decoupled from the pressing process, meaning that the seam can cool down before the press is opened. This in turn prevents uncontrolled delamination during the solidification of the seam, as is observed in conventional processes. As a result, the overall lifetime of the pouch cells is increased as wrinkles are avoided by the highly accurate sealing process with the TruHeat VCSEL. Depending on the cell format, the processing area of the VCSEL heating systems can be adapted flexibly.

Visit TRUMPF at the Battery Show Europe 2023, Hall 10, Booth H20

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VCSEL-based heating systems made in Germany

TRUMPF designs and manufactures its VCSEL-based heating systems in Germany.



Lower CO2 emissions at battery foil drying

TruHeat VCSEL systems have a higher efficiency as conventional drying processes. Energy efficiency is increased by a factor of two or more.



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TruHeat VCSEL systems offer individual heating zones

The TruHeat VCSEL systems generate directed and homogeneous infrared radiation.

About TRUMPF Photonic Components

TRUMPF Photonic Components is a global technology leader, supplying VCSEL and photodiode solutions for consumer electronics, datacom, automotive, industrial sensing and heating markets. So far, more than two billion VCSEL chips and photodiodes have been shipped worldwide. The staff continues to drive its 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 USA.

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 one of the world technological and market leaders for machine tools used in flexible sheet metal processing, and also for industrial lasers and metal 3D printing. In the 2021/22 fiscal year, the company employed some 16,500 people and generated sales of about 4.2 billion euros. With over 80 subsidiaries, the TRUMPF Group is represented in nearly every European country, 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

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