Press Release

RAYLASE presents RAYDIME, its new OCT-based process monitoring product series

Wessling, Germany – June 7th, 2024

RAYLASE is proud to announce its new RAYDIME product line, a series of convenient optical coherent tomography (OCT) solutions for process control and monitoring. Tailored to the requirements of prefocussing beam deflection units, the new product series will extend RAYLASE's AXIALSCAN FIBER series and AM MODULE III with relevant process monitoring technology. Its first product is the RAYDIME METER, an OCT-based distance measurement sensor that helps automate complex production processes like busbar welding in battery production. Further monitoring tools are in the development pipeline.

RAYLASE introduces new product series for process monitoring

Modern laser-based production machines consist of many components that all need to work together seamlessly. Here, integrated scanning solutions have proven their value. With the AXIALSCAN FIBER series and the AM MODULE III, RAYLASE successfully offers such products tailored to the needs of the e-mobility market and laser-based additive manufacturing. Instead of selling individual components, they listen to their customers' challenges and build solutions targeting specific applications. As a result, many companies rely on RAYLASE products when producing battery cells or when bringing Additive Manufacturing to the production scale.

However, for process automation or quality control, more and more monitoring tools such as cameras, melt pool sensors, or OCTs, are included in the machines besides the actual laser processing. And these tools are notoriously difficult to integrate.
"The sensors use the same optical path as the processing laser or at least need an exact alignment. Additionally, the sensors need to be synchronized with the movements of the beam deflection units or with the laser source," explains Dr. Philipp Schön, CEO of RAYLASE. "Therefore, we want to take the next step and extend our scanning solutions with the process monitoring tools necessary for a state-of-the-art production."

OCT sensors designed for prefocussing beam deflection units

With its RAYDIME series, RAYLASE now offers on-axis process monitoring tools based on spectral domain OCT (SD-OCT). In contrast to other OCT sensors available on the market, the new RAYDIME sensor is developed to work with prefocussing beam deflection units, which are the optimum choice for high-power welding and cutting applications. However, it hasn't been possible to combine them with OCT-based sensors so far.
Thanks to the RAYLASE SP-ICE-3 control card and the fast RAYVOLUTION DRIVE z-axis, RAYLASE has the

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perfect technology for an accurate high-speed optical correction of the OCT's sample arm. This is crucial for integration with prefocussing scan systems like the AXIALSCAN FIBER or the AM MODULE III and allows users to combine large working fields with reliable process monitoring, ensuring process quality and efficiency.

RAYDIME METER launches in Q2/2024

The first product of the RAYDIME series will be the RAYDIME METER, and its launch date will be in the middle of this year. It is a precise distance measurement sensor developed for sophisticated welding applications and is an essential part of the RAYLASE BUSBAR WELDING MODULE for modern battery production. In combination with an AXIALSCAN FIBER RD-30, the RAYDIME METER allows precise distance measurement with an accuracy of ±10 µm in a field of 500 x 500 mm² and enables topography scan for e.g., a highly automated busbar welding process with a z-autofocus in less than 50 ms.

Additionally, the RAYDIME METER simplifies the quality process in many ways. Firstly, it eliminates the need for additional post-weld quality control tools as it provides comprehensive insight into the weld quality immediately after welding. This saves time and significantly reduces the costs associated with using multiple inspection methods. Secondly, the immediate availability of detailed quality data enables direct reworking of parts in the event of defects. These immediate corrections minimize production delays, increase overall efficiency, and ensure that the final product meets the industry's stringent quality standards.

"We are delighted that we found a way to make OCTs also available for prefocussing beam deflection units," says Philipp Schön. "And we hope that, with our new RAYDIME series, we can offer many customers the necessary tools for their specific applications."

About RAYLASE GmbH

RAYLASE is a renowned solution provider for precise and efficient laser processing in an industrial environment. For its core markets, AM, e-mobility, electronics, and solar, it provides optimized laser scanning systems combining scan heads with cutting-edge optics, sensors, and intuitive software. Tools for adjacent processes like field calibration complete the portfolio. With its products, RAYLASE supports customers worldwide in building a reliable production based on the most efficient laser processes.

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