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COHERENT IS ONE OF THE WORLD'S LEADING PROVIDERS OF LASERS AND LASER-BASED TECHNOLOGY.



► Dr. Reinhard Luger, VP and managing director of Coherent in Lübeck. ►

IN THIS Q&A, DR. REINHARD LUGER, VP AND MANAGING DIRECTOR OF COHERENT IN LÜBECK, PROVIDES AN INSIGHTFUL OVERVIEW OF THE COMPANY'S FAST-GROWING LÜBECK BUSINESS UNIT.

Riding the wave of success at Coherent's Lübeck Business Unit

WHAT IS COHERENT'S LÜBECK BUSINESS UNIT?

Coherent is a US-based leading photonics manufacturer and the Lübeck Business Unit in Lübeck, Germany, is one of its largest business segments. The Lübeck Business Unit's product portfolio includes diode-pumped solid-state lasers (DPSSLs) as well as optically pumped semiconductor lasers (OPSLs), the technology for which was pioneered by Coherent.

We offer products with power ranging from tens of milliwatts to tens of watts, and with everything from continuous wave and quasi-continuous wave output to pulsed output in the nanosecond regime. Our range of wavelengths is equally comprehensive, from the near-infrared (NIR) through the visible and well into the ultraviolet (UV). We have established a reputation for achieving visible wavelengths not possible with other lasers thanks to Coherent's patented OPSL technology. We have also come to be regarded as a leader in high-power UV wavelength.

WHAT ARE THE UNIT'S FUTURE GROWTH PLANS?

Demand for our products is strong, and we are undertaking a significant expansion in order to support this. We will soon be moving from our current 8,000 m² site to a new, 13,500 m² purpose-built factory on land owned by Coherent, although still in Lübeck.

We see several important benefits with this expansion. First, we are constructing facilities that are more efficient and optimised for our exact needs. Specifically, this will be a world-class manufacturing site, with advanced capabilities for UV lasers in particular. Also, having all our employees under one roof will improve workflow and enhance communication. Finally, the extra space will allow for future expansion and enable us to keep up with increased demand.



► The Coherent Lübeck Business Unit offers a comprehensive portfolio of lasers and laser-based solutions for a number of life science and medical applications. ►

WHAT ARE THE UNIT'S KEY MARKETS AND WHY?

Our primary markets are bioinstrumentation and microelectronics. However, we also support numerous other applications, including stereolithography (SLA) and marking.

The majority of our customers' bioinstrumentation applications rely on sample analysis by means of laser-excited fluorescence. Key examples are flow cytometry, confocal microscopy and DNA sequencing. The first two are characterised by two trends, namely the need for an increased palette of wavelengths and a growing demand for value-added products that integrate optics, mechanics and multiple lasers.

Flow cytometry (as well as confocal microscopy) requires multiple laser wavelengths to support multi-parameter analysis. Here, the combination of multiple excitation wavelengths and a constantly growing family of fluorochromes can allow a single instrument to count as many as 50 different cell types in a single data run. Our wavelength-flexible OPSL technology has provided us with a key advantage in building this business.

► *OBIS is a portfolio of compact UV, visible and NIR lasers. The range also includes laser beam combiners, miniaturised lasers in OEM format and accessories such as remote controllers, power supplies and cables.* ►



► The Coherent Lübeck Business Unit is moving to a new purpose-built factory that will focus on the development and manufacture of products for challenging applications. ►

In microscopy, many companies are working to combine optical microscopy with atomic force microscopes and scanning electron microscopes in a single platform. These instrument builders often prefer to buy a laser spot rather than purchase lasers and construct their own beam delivery systems. Here, Coherent's vertical integration—which enables us to package lasers, control electronics and beam delivery optics into a single integrated solution—gives us a decidedly competitive edge.

I use the term microelectronics broadly to cover everything from front-end wafer fabrication through advanced packaging, since Coherent produces lasers for individual applications in numerous different areas across this market. For example, one of the earliest steps in integrated circuit fabrication is inspection of un-patterned wafers to identify contaminants. Our Azure and Paladin lasers, which employ different types of specialised UV DPSS technology, are utilised for this application as well as for patterned wafer inspection. The Azure laser is also used for lithography mask inspection.

Part marking is employed extensively in semiconductor manufacturing, since it enables the strict process control that has become key to optimising fabrication yields and costs.

However, these marks must be small, and it is essential that the marking process does not affect the performance or properties of the device. Non-contact laser marking, using UV DPSSLs such as those in our Matrix series, is widely utilised for this purpose.

At the other end of semiconductor production is packaging, and the demand for ever smaller yet more sophisticated mobile devices is driving the development of a variety of advanced packaging technologies. Our Paladin lasers employ laser direct imaging (LDI) technology, which eliminates the need for photomasks by allowing for the direct writing of the pattern on the circuit board. Smaller and more delicate advanced packages also require more precise cutting with less heat affected zone. Our AVIA LX DPSSL serves this purpose by cutting flexboards and scribing system-in-package (SIP) devices.

Coherent has gained a leadership position in the microelectronics market, and there are two main reasons for this. First, the market requires ever smaller components with ever higher functionality, which in turn is driving demand for both inspection and materials processing with UV lasers. Second, downtime is extremely expensive in microelectronics, so our ability to deliver exceptional quality UV lasers against tight timescales is a winning combination. ●



LEADING & INNOVATING TO ENABLE TOMORROW'S MICROELECTRONICS

From lasers to complete laser-based tools, Coherent enables the precision manufacturing of tomorrow's devices today. **Wafers** to **IC Packages**, **Flex Circuits** to **Displays**—our solutions deliver superior processing results with increased throughput and reliability.

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