Laser and Laser Systems
for Material Processing

German laser industry:

- **Development of the German laser industry in 2025, challenges**
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- **Photonic communication: How light is becoming the language of the future - from ultra-fast data transmission to new dimensions of networking**
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Press conference of the VDMA Working Group Laser and Laser Systems for Material Processing at Laser World of Photonics on June 24, 2024

Your discussion partners are:

Dr. Sven Breitung, Managing Director VDMA AG Lasers and Laser Systems for Material Processing

Dr. Stefan Ruppik, Vice President and Managing Director CO_2 Lasers Business Unit of Coherent and Vice Chairman of the VDMA Working Group Laser and Laser Systems for Material Processing

Dr. Christoph Ullmann, Managing Director of Laserline GmbH and Chairman of the VDMA Working Group Laser and Laser Systems for Material Processing

Dr. Hagen Zimer, Chief Executive Officer Laser Technology, Member of the Management Board of TRUMPF SE + Co. KG and Member of the Board of the VDMA Working Group Laser and Laser Systems for Material Processing

- The spoken word prevails -

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Development of the German laser industry in 2025, challenges

Ladies and gentlemen, representatives of the press,

I would like to welcome you to the press conference of the VDMA Working Group Laser and Laser Systems for Material Processing as part of Laser World of Photonics 2025.

Today I would like to give you an overview of the market situation in the laser industry from the perspective of the members of the VDMA Working Group Laser and Laser Systems for Material Processing. The members include the leading manufacturers of laser beam sources and laser processing systems as well as producers of optical components and other equipment for laser technology as well as research institutes and universities.

In a recent survey of member companies, we looked at the development of incoming orders in Germany and abroad as well as turnover. We looked at the expectations for the current year compared to the previous year. We also identified the markets that will be particularly supportive of incoming orders in 2025, as well as which markets are currently difficult. Last but not least, we looked at the current challenges facing the laser industry in 2025.

47% of members who took part in the survey expect incoming orders in Germany to stagnate in 2025 compared to 2024. 34% indicated a decline. The members' estimates of the extent of the decline vary widely. Some members expect a moderate decline in the 0-5% range, but other members indicate higher values for the decline, up to the 20% range. 19% of respondents stated that they expect an increase and indicated the amount of the increase in incoming orders with values of 0-10%.

Expectations for order development abroad are significantly more positive. 41% of respondents expect an increase in 2025 compared to the previous year. The positive expectations are concentrated in the 6-10% range. 38% of the members who responded expect stagnation here too.

The survey also asked about the development of turnover in 2025 compared to 2024 and of the companies participating in the survey 44% stated that turnover will increase, 38% expect it to stagnate and 21% of companies indicated a decline.

Statements on the level of increase and decrease vary greatly according to the companies participating in the survey. 19% stated that turnover would increase by 6-10%. 9% expect a decline of the same magnitude of 6-10%.

The markets supporting the expected strong increase in incoming orders were identified in countries such as Germany and the USA. However, other countries from Asia and Europe were also mentioned.

Countries such as the USA and China were named as particularly difficult markets, as were other countries in Europe, Asia and Germany.

In the survey, member companies were asked about the current challenges for the laser industry. The survey revealed that the current geopolitical risks and the economic policy of the new US government pose the greatest problems. However, the general conditions in Germany, such as the high wage and non-wage labor costs, the declining competitiveness of Germany as an industrial location and the high level of bureaucracy are also problematic for the laser industry. At the last press conference at Laser World of Photonics 2023, the shortage of skilled workers was the biggest problem. According to the latest surveys, this problem has receded further and further into the background, but after discussion with the

members, this is not because the problem has been solved, but it is a further sign of the poor overall economic situation.

The economic situation in the laser industry is currently challenging - characterized by a reluctance to invest, geopolitical uncertainties and weakening export markets. Although the first signs of stabilization are visible, a sustainable recovery is still a long way off. The VDMA is actively supporting the industry in this phase with targeted advice, market information and initiatives to strengthen the resilience of companies. At the same time, the association is lobbying politicians for innovation-friendly framework conditions, faster approval procedures and investment in digital infrastructure. Only through coordinated interaction between the industry, the association and politicians can the laser industry be put back on a sustainable growth path.

Thank you for your attention!

TRUMPF

Ladies and gentlemen, representatives of the press,

I would also like to welcome you to the Laser World of Photonics 2025 press conference.

Whether it's price pressure or strained supply chains all over the globe, companies in the laser industry like any other industries are facing right now a wide range of challenges. The most effective means of preparing ourselves for this is our innovative strength.

Users of our technologies strive for ever greater efficiency, productivity, and sustainability. Our solutions, which are becoming increasingly powerful and efficient, remain a key element in meeting these needs. In addition to improving our lasers, sensors, and optics, at TRUMPF, we are also committed to further developing technologies that work with artificial intelligence (AI).

Our AI technology is already improving our customers' productivity in the field of sensor technology, for example in the area of electromobility. AI simplifies the ramp-up of production and improves the yield of high-quality components. In the manufacturing of batteries for electric cars, this means less waste from components made from valuable raw materials, which in turn contributes to sustainability in this industry.

Laser technology must not only increase its impact in established applications but also open up to new business fields. These can be found e.g. in the field of secondary sources. For example, TRUMPF is developing a customized beam source for generating neutron beams to examine nuclear waste containers in a joint project with partners.

Thank you for your attention!

Coherent

Dear Ladies and Gentlemen, dear representatives of the press,

I welcome you to the press conference at Laser World of Photonics 2025 and thank you for coming.

If there’s one trend that truly highlights the growing importance of photonics — it’s artificial intelligence and data centers. This is, without a doubt, the most significant market shift we’re a part of today. We all see the rapid development of AI in our professional and personal lives, and I’m sure most of us have used ChatGPT, Gemini or other AI tools already. For Coherent,

AI and data centers represent perhaps the most important growth area in our transceiver and optics business.

While many of us here at Lasers Munich work on lasers for industrial applications, we may not always have full visibility into how essential semiconductor lasers are to modern communication networks. Fiber optics and transceivers aren't just for subsea cables anymore — the fiber optic network now extends deep into data centers, and further, into the AI compute infrastructure itself.

Semiconductor lasers used in transceivers play a vital role: they translate electrical signals into optical ones and back again, enabling the vast flow of information across global and local networks. Whether we realize it or not, we interact with this technology every day.

For instance, when you enter a search query online, that request may travel hundreds of miles to a data center and back via the fiber optic network. Within that data center, hundreds of computers collaborate to generate your search result. These computers are interconnected using optical fiber, and Coherent's transceivers are very likely involved in that data path.

Coming back to photonic communication and AI: photons have remarkable physical properties compared to electrons, making them especially suitable for high-speed data transmission. As data rates and computing demands increase, we inevitably reach the physical limitations of copper-based electrical connections. That's when photons — and optics — become essential.

In the early data centers, communication between computing nodes was entirely electrical. Today, the entire *scale-out* portion of the data center network — meaning the connections between racks — is optical. And this optical network continues to grow and expand to support the underlying increase in compute capacity.

Looking ahead, we expect the *scale-up* portion — the links within each rack — to begin transitioning to optics as well. These connections are still 100% copper today, but as data rates rise, they too will need to go optical. It's not a question of *if*, but *when*. And this next phase will further increase the importance of optical networking in AI data center architectures.

At the heart of this transformation is the optical transceiver — the enabling component for high-speed, scalable, and efficient data transmission.

Twenty years ago, the fastest optical transceivers delivered 10 gigabits per second. Today, a significant portion of Coherent's datacom shipments comes from **transceivers at 800G and above**. These products use multiple 200G lanes — four lanes for 800G, eight lanes for 1.6T — to deliver massive bandwidth. We are already shipping 800G transceivers in volume, and we expect the first 1.6 terabit transceivers to enter production in the coming years.

To put this into perspective: around the year 2000, semiconductor technology was at the 250-nanometer node. Today, we're manufacturing at 2 nanometers — a 100-fold shrink, packing tens of billions of transistors onto a single chip. Remarkably, optics has kept pace: over the same period, data rates in transceivers have increased from 10 Gb/s to 1.6 Tb/s — also a factor of about 100. This shows that photonics is advancing at a rate similar to the most celebrated scaling curve in technology: Moore's Law.

And that's why we believe photonics — and especially Coherent's role in photonic communications — will be a foundational enabler of the AI-powered future.

Thank you for your attention!

Laserline

Ladies and gentlemen, dear representatives of the press,

I would also like to welcome you to the Laser World of Photonics 2025 press conference. Laser technology has become an integral part of a sustainable future. As Europe's laser manufacturer, we not only stand for technological innovation, but also for responsibility in processes and results for the customer. Our strength lies in combining in-depth process expertise with a clear understanding of industry-specific requirements – creating solutions that are not only technologically leading, but also precisely tailored to the needs of our customers. We create differentiation through sustainable processes and customized solutions – at the same time setting standards for a greener industry. In recent years, three areas of application have stood out in particular, in which the diode laser is persuasive in its contribution to sustainability:

- Energy generation through laser fusion
- Coating with IR and blue diode lasers
- Laser drying

The future of energy supply could be emission-free, safe and available around the clock – if we succeed in making **nuclear fusion** technological practicable. US researchers laid the foundation for this in 2022, where for the first time more energy was released from a fusion reaction than was introduced by the initializing laser – and ultimately achieving a factor 2 gain. This breakthrough highlights the potential of laser fusion, as it promises a climate-neutral and virtually inexhaustible source of energy.

High-power diode lasers play a central role in this as they are the key component for fusion power plants of the future. In the joint project DioHELIOS, funded by the German Federal Ministry of Education and Research as part of the “Fusion 2040” program, Laserline works alongside five other partners – including Trumpf – to further develop precisely this key technology: high-power diode laser modules for future fusion power plants. The aim is to increase the performance and efficiency of these modules and to develop ways for automated mass production. After all, economical fusion requires a great many of these modules – reliably, and efficiently.

Europe – and Germany in particular – is ideally placed to play a leading role here. With our experience and technology, we are laying the foundations for the climate-neutral energy supply of tomorrow.

Coating is another pioneering application. The diode laser serves as a precise heat source that melts the workpiece surface and the coating material in a single step. These coatings serve as corrosion and wear protection and significantly extend the service life of the components. In addition, laser cladding can target excellent frictional properties for the workpiece surface. A current example of sustainable coating solutions is their use in plain metal bearings – for example, in wind turbines. This type of laser-based coating is not only economically attractive but also it also delivers high quality. Conventional processes are often energy and material-intensive – and sometimes use lead-containing alloys that are harmful to health. In one customer application, the use of diode lasers increased energy efficiency by almost 90% and completely replaced lead-containing alloys.

Coating with copper is also becoming increasingly important. Blue diode lasers can already achieve application rates that are three times higher. Other examples include the coating of brake disks to reduce fine dust or the repair of damaged components, for example, whose function can be restored through the targeted application of material. All solutions are

developed in close cooperation with our customers and individually tailored to the respective requirements.

Another field of application is **drying**, as used in battery production, for example. Today, large roll-to-roll ovens dominate, but a new approach combines hot air and laser modules: Laser drying with a homogeneous beam profile takes over the pre-drying of the electrode paste, while the downstream convection oven implements the temperature holding time. This hybrid process supports gradual retro-fitment, increases the web speed to up to 30 m/min, and reduces the drying time by up to 60% while maintaining the same quality. This significantly improves the CO_2 balance and makes the process more economical. Diode lasers are also used in fuel cell production and semiconductor manufacturing – for example, when annealing wafers to remove defects. With their precise temperature control, high efficiency and superior performance, they are the ideal heat source for many modern applications.

These examples strikingly demonstrate how laser technology can make a real contribution to sustainability and clearly sets itself apart from conventional processes. Diode lasers are not only particularly energy efficient – over 55% – but also enable a wide range of resource-saving applications. Thanks to their flexibility, they are a crucial building block for a sustainable industrial future.

Thank you for your attention!

The members, board and management of the working group would like to thank you for your interest. We wish you a successful visit to the trade fair and informative discussions!

Munich, June 24, 2025