

PRESS RELEASE

PRESS RELEASEFebruary 21, 2017 || Page 1 | 3

Efficiency Boost for Laser Cutting and Drilling at LASER CHINA

The Chinese market for industrial laser technology is still growing fast and so does the LASER World of PHOTONICS CHINA, which has become the most visited trade show for lasers and optical components. At this year's trade show, the Fraunhofer Institute for Laser Technology ILT will be presenting new ideas for industrial laser applications, most of which are focused on increased efficiency of laser micro machining processes (Hall N4, Booth 4243).

When the LASER World of PHOTONICS CHINA opens its doors in Shanghai on March 14, several new records are expected. According to the organizers, the number of exhibitors will increase to about 850 and the number of visitors may well exceed 45,000.

Helical optics for ultra-fine drilling and cutting applications

For the longest time, laser beam sources were the limiting factor for industrial applications of ultrashort laser pulses. This has changed remarkably with the introduction of new stable laser systems. And now process technology is catching up.

One example is the helical optics system from Fraunhofer ILT. In the center of this device, a Dove prism rotates at up to 10,000 rpm. At first this leads to a rapid rotation of the beam itself, allowing for an effective smoothing of the beam profile.

In addition, the laser beam rotates on a circular trace with an adjustable diameter. You can also set the tilt of the beam, allowing full control of the aspect ratio and conicity of the borehole.

Using a TRUMPF TruMicro 5270, the system was able to create hole diameters ranging from 10 to 500 microns in sapphire or hardened glass (such as Corning Gorilla glass) with smooth surfaces and no cracks.

The optics unit is self-aligning and comes with complete sensor equipment and control software. Although still in the prototype, this system has already been delivered to numerous R&D groups, primarily to Asia-based customers in the fields of micro and consumer electronics.

Editorial Notes

Petra Nolis M.A. | Group Manager Communications | Telephone +49 241 8906-662 | petra.nolis@ilt.fraunhofer.de
Fraunhofer Institute for Laser Technology ILT | Steinbachstraße 15 | 52074 Aachen, Germany | www.ilt.fraunhofer.de

FRAUNHOFER INSTITUTE FOR LASER TECHNOLOGY ILT

Multi-beam optics boost productivity for ultrashort pulses

Productivity is currently the largest obstacle to the widespread use of ultrashort pulsed lasers in industrial applications. Now that stronger laser sources are available, it is possible to divide one beam into numerous beamlets and start parallel processing.

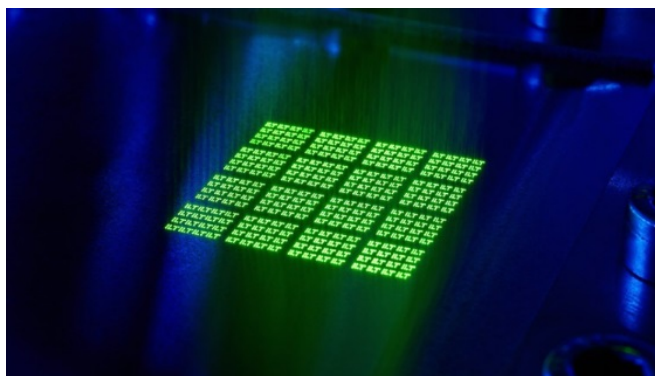
Experts at Fraunhofer ILT have developed several different solutions for this purpose. The first generates a static spot pattern using diffractive optical elements (DOE). This is very helpful for surface texturing or the drilling of large numbers of similar holes.

A second solution uses spatial light modulators (SLM) based on liquid crystals for pattern generation. They can switch the spot pattern up to 50 times per second and patterns can be programmed to almost any shape. Coupled with a galvanometer scanner, this system can rapidly scan the workpiece and dynamically change the number or shape of laser spots.

Such multi-beam optics are now ready for 24/7 applications for customers in the microelectronics, automotive and consumer-goods industries.

Fraunhofer ILT at LASER World of PHOTONICS CHINA

The experts from the Fraunhofer ILT in Aachen, Germany, supply technology solutions for laser micro and macro processing of various materials. Among other things, they will be presenting the Laserfact Combihead, which enables high-precision cutting and welding without changing tools. You will find them at LASER CHINA from March 14 to 16, 2017 in Hall N4, Booth 4243. For in-depth information on our exhibits, please see <http://www.ilt.fraunhofer.de/en/fairs-and-events/fairs/laser-china-2017.html>

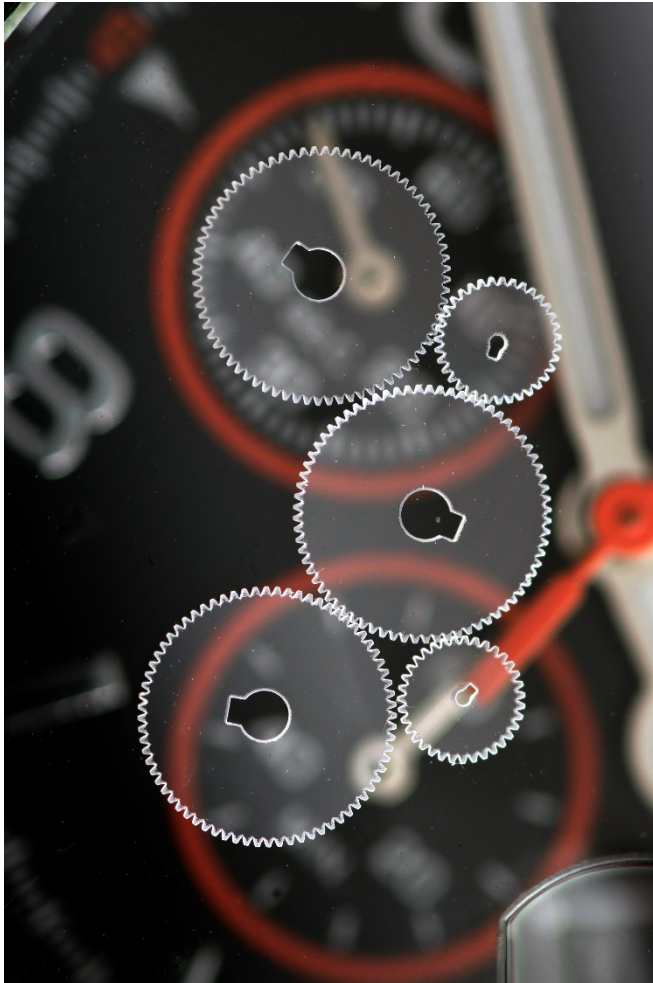


Picture 1:
A programmable multi-beam optics with galvanometer scanner can split the laser into any number of beamlets. The resulting pattern can be changed and positioned anywhere on the workpiece.

© Fraunhofer ILT, Aachen, Germany / Volker Lannert.

PRESS RELEASE

February 21, 2017 || Page 2 | 3



Picture 2:
An example of helical optics:
Cutting microgears in
sapphire glass for luxury
watches.
© Fraunhofer ILT, Aachen,
Germany.

PRESS RELEASE

February 21, 2017 || Page 3 | 3

The **Fraunhofer-Gesellschaft** is the leading organization for applied research in Europe. Its research activities are conducted by 69 institutes and research units at locations throughout Germany. The Fraunhofer-Gesellschaft employs a staff of 24,500, who work with an annual research budget totaling 2.1 billion euros. Of this sum, 1.9 billion euros is generated through contract research. More than 70 percent of the Fraunhofer-Gesellschaft's contract research revenue is derived from contracts with industry and from publicly financed research projects. International collaborations with excellent research partners and innovative companies around the world ensure direct access to regions of the greatest importance to present and future scientific progress and economic development.

For further information

Dipl.-Phys. Frank Zibner | Micro and Nano Structuring | Telephone +49 241 8906-325 | frank.zibner@ilt.fraunhofer.de

Dipl.-Phys. Patrick Gretzki | Micro and Nano Structuring | Telephone +49 241 8906-8078 | patrick.gretzki@ilt.fraunhofer.de
Fraunhofer Institute for Laser Technology ILT, Aachen, Germany | www.ilt.fraunhofer.de/en