Alpine Laser

www.alpinelaser.com

Alpine Laser was founded in 2019 by Joe Kempf and a colleague. After gaining decades of experience in the medical technology industry, they founded Alpine Laser, a start-up aimed at producing better and faster machines for the sector. After the first year of development, the demand for their innovative tube cutting machines increased exponentially. The first machines were delivered to customers in 2022. They manufacture small flexible tubes for medical purposes. The modular design allows for the swift utilization and interchangeability of a wide range of tools, lasers and attachments, tailored to the specific requirements of each production order.

INDUSTRY
Medical technology

NUMBER OF EMPLOYEES
5 humans and one dog

LOCATION
Bloomington, Minnesota (USA)

TRUMPF PRODUCTS

- TruMicro 2000
- Hollow-core fiber LLK-U

APPLICATIONS

- Laser cutting
- Laser tube processing

Challenges posed by market forces and modular machines

Joe Kempf plans to build micromachining machines and sell them to manufacturers of stents and similar tubes. The demand for these tubes is high and producers cannot keep up with demand using their machines. However, entry to the market is strictly controlled by regulatory bodies worldwide. This is why major manufacturers of stent cutting machines are segmenting the market among themselves, inadvertently creating a bottleneck as both production processes and products become outdated. Alpine Laser is working on machines that can meet demand more rapidly and efficiently than the established companies. When designing such machines, a critical compromise always arises – on one hand, the machine should be easily scalable, ensuring cost-effectiveness and swift production. On the other hand, it must retain individual configurability. Kempf: "We realized that only a modular system design could reconcile both objectives." Additionally, only an ultrashort pulse laser can achieve the required quality and time savings.

"Ultrashort pulse lasers generate cut edges so clean that our customers produce parts that no longer require post-processing with harsh chemicals."

JOE KEMPF
FOUNDER AND CEO OF ALPINE LASER

Solutions – laser light cable and femtoseconds

Alpine Laser gets in touch with TRUMPF. The two companies then work together to develop the Medicut Pro from Alpine Laser – the world's first machine to use an ultrashort pulse laser with hollow-core fiber feed for industrial-scale production. A notable advantage lies in the exceptional beam quality of the TruMicro, generating virtually rework-free cutting edges. Achieving precision with tubes as small as 0.25 millimeters in diameter and a mere 0.5 millimeters in wall thickness is unattainable without a femtosecond laser. The modular system that Alpine Laser designs for this purpose now processes the complex components between two and five times faster than conventional machines. With highly flexible tools, configuring the part holder and aligning the optics takes less than five minutes, highlighting an impressive level of speed. The world's smallest stent machine achieves all this with a footprint of just 1.2 by 0.7 metres. The laser light cable takes care of this. It enables compact and flexible beam guidance from the laser source to the workpiece.

Implementation through exclusive collaboration on ultrashort pulse laser with this partner

The more Joe Kempf's team focused on the required applications, the more often the name TRUMPF cropped up. Alpine recognized that the TruMicro series specifications and the new laser light cable meant that there was nothing comparable on the market. They worked with their contacts at TRUMPF to rethink their product design. Excitingly, this marks TRUMPF's inaugural large-scale application for the new fiber guide designed for ultrashort pulse lasers. As the first machines are delivered to customers, Kempf is already contemplating additional collaborations with TRUMPF: "We believe that our work is far from done; we are just getting started."

The future is looking bright

Kempf is just getting started and is already considering integrating ultrashort pulse lasers into new flat sheet cutting systems for complex laser-cut catheter insertion systems. He explains: "We have a long list of products in the pipeline that could benefit from an overhaul – by updating old industrial designs with new, cutting-edge technologies."