



MED-EL Elektromedizinische Geräte Gesellschaft m.b.H.

www.medel.com

In 1975, when Ingeborg and Erwin Hochmair started developing the first cochlear implants at the Vienna University of Technology, they were laying the groundwork for their future enterprise, MED-EL. It wasn't until 1990 that they brought their first employees on board at the Innsbruck site. The family-owned company, led by Ingeborg Hochmair, now employs 2,500 individuals from 80 different nations across 30 sites, serving customers in over 140 countries. MED-EL provides a wide-ranging portfolio of both implantable and non-implantable hearing devices. Research and development remain pivotal for this innovative company. The primary focus is always on the individual, and the overarching objective of enhancing their quality of life by restoring the joy of hearing. Customers include clinics, doctors and also audiologists who accompany patients on their journey.

INDUSTRY	NUMBER OF EMPLOYEES	LOCATION
Medical technology	2,500	Innsbruck (Austria)

TRUMPF PRODUCTS

- TruMark Station 5000
- TruMark 3130

APPLICATIONS

- Laser lettering
- laser cutting

Challenges

All human beings are different, and so are their ears. Dietmar Köll highlights the need for customized hearing implants, stating, "We operate with a high degree of dynamism and strive to integrate customer feedback into our product range. This is why we offer a comprehensive portfolio with a modular structure. This approach enables us to find the most appropriate solution for different listening scenarios."

Another challenge is that the parts are becoming increasingly small. Simultaneously, the demands for product traceability and comprehensive documentation of production processes are on the rise. Consequently, an increasing number of markings need to be applied, and these must remain highly legible and resilient despite the limited available space. Köll underscores, "Our products are worn by patients both on and inside their bodies, which means they have to be small, extremely durable and stable." In terms of production, this translates to smaller quantities and customized parts. This in turn requires flexible machines that meet the rigorous standards of medical technology.

Another significant aspect at MED-EL is the digitalization of their products. "It is now standard that implants can be controlled via a simple smartphone app," explains Fankhauser. Köll asserts, "To stay competitive, we must keep up with this trend."



"We are very enthusiastic about conducting extensive testing and experimentation. In addition to laser marking, we also conduct cutting tests on a diverse range of materials."

CHRISTOPH FANKHAUSER

DEPUTY GROUP LEADER, MANUFACTURING
EXTERNAL DEVICES AT MED-EL



Solutions

The marking laser, initially a TRUMPF Vectormark VMC4, has been delivering the required flexibility for marking tasks at MED-EL since 2004. Prior to this, external service providers were responsible for marking the parts. In the long run, this proved to be extremely slow and inflexible. Christoph Fankhauser, Deputy Group Leader for Manufacturing External Devices at MED-EL, takes up the story: "Regulatory requirements mean that we have to modify the markings frequently. Additionally, fluctuations in material quality often necessitate swift laser adjustments to ensure the markings remain easily readable." "If we have to coordinate this with a supplier beforehand, it results in unacceptable time delays," The laser marking of parts is too critical for such delays. In 2010, the company introduced its first TruMark Station 5000, in a bid to move this crucial production step in-house, underscoring the significance and premium quality of the markings. "Our primary applications involve affixing serial numbers and machine-readable UDI codes onto metal and plastic parts." Fankhauser points out, "We also incorporate symbols such as arrows and notes to enhance user-friendliness."

Given that many of the markings are visible on the final product, MED-EL places significant emphasis on maintaining consistent font styles and sizes. Achieving a high contrast is crucial for this purpose, as it guarantees excellent readability. "And, of course, the markings have to be reproducible," emphasizes Fankhauser. "The TruMark laser fulfills these requirements, even when marking extremely small parts."

Implementation

MED-EL currently has a total of three TruMark Stations 5000 units in their production area. These machines are used for marking implant components, as well as external system components and accessory parts. All marking stations use TruMark Series 3000 lasers. Fankhauser notes, "We initially began with a green laser, but we now use infrared light with a wavelength of 1064 nanometers due to its exceptional flexibility."

MED-EL uses the marking lasers to label plastic components as well as the metal housings of implants. These are made of titanium, and some parts of platinum-iridium alloys. The greatest challenge is the marking of plastic parts. Fankhauser elaborates, "We handle an extensive range of products, encompassing over 1,000 items that require marking with unique product codes and serial numbers." Due to the substantial variety of parts sourced from suppliers, we sometimes encounter variations in material quality within specific batches. Time and again, the production team finds itself adjusting the laser parameters. "At the same time, there is very little space on the parts and yet we still have to ensure the machine readability of the marks. It isn't always easy." Nonetheless, the dedicated team addresses

this challenge by combining their specialist expertise with the precision of TruMark marking lasers.

In series production, MED-EL also uses the TruMark lasers for depaneling blanks. "We are very enthusiastic about conducting testing and experimentation", says Fankhauser. "We use the lasers for marking prototypes, and we conduct cutting and marking trials on a wide range of materials in collaboration with the development department," Fankhauser explains. Dietmar Köll, his colleague, affirms that this spirit characterizes MED-EL, saying, "Even after all these years, our processes remain adaptable and dynamic. "We are always working on new developments and we are happy to adapt and innovate."



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Forecast

In future, the TruMark 6030 may assume responsibility for marking parts in MED-EL's implant manufacturing process. "The laser provides us with integrated laser power regulation. "As a medical product manufacturer, this is naturally quite exciting for us," explains Dietmar Köll. The power is always automatically adjusted and remains stable. Additionally, this means that there is no variance between the lasers. Köll emphasizes, "This enables us to document the laser's power stability, thereby ensuring compliance with statutory logging and documentation requirements." Furthermore, TRUMPF now offers support with IQ/OQ certifications to make it easier to comply with legal requirements. For Köll, there is no question that his company will again opt for a TRUMPF laser: "Reliable machines are paramount for our production. And we require a partner to provide support when we are testing something new, in the event of technical queries or if there is an issue with the system. TRUMPF simply gets the whole package right."

Find out more about our products



TruMark Station 5000

For those in search of a compact and versatile marking system, the TruMark Station is an ideal choice, serving as a perfect all-rounder. This machine can function as both a standing or sitting station, integrate seamlessly into a flow line and can also be enhanced with features



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such as a rotary axis or image processing software.



TruMark 3330

The TruMark 3330 marking laser enables users to handle an impressively diverse range of materials. The laser emits ultraviolet radiation. This enables the reliable processing of materials like polymers, as well as metals such as copper and aluminum. The exceptional beam quality and high pulse-to-pulse stability guarantee optimal marking outcomes.



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TruMark 6030

The TruMark 6030 marking laser is a multifunctional tool that emits infrared radiation. It is especially well-suited for processing a wide range of metals and plastics that contain additives. These additives serve to enhance the absorption of infrared laser radiation. The marking system impresses with its consistently high-quality and reproducible markings, offering the flexibility to mark components with free-form 3D geometries.



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