



Lasers for medical technology:

Quality in Focus



Laser technology with medical technology expertise.

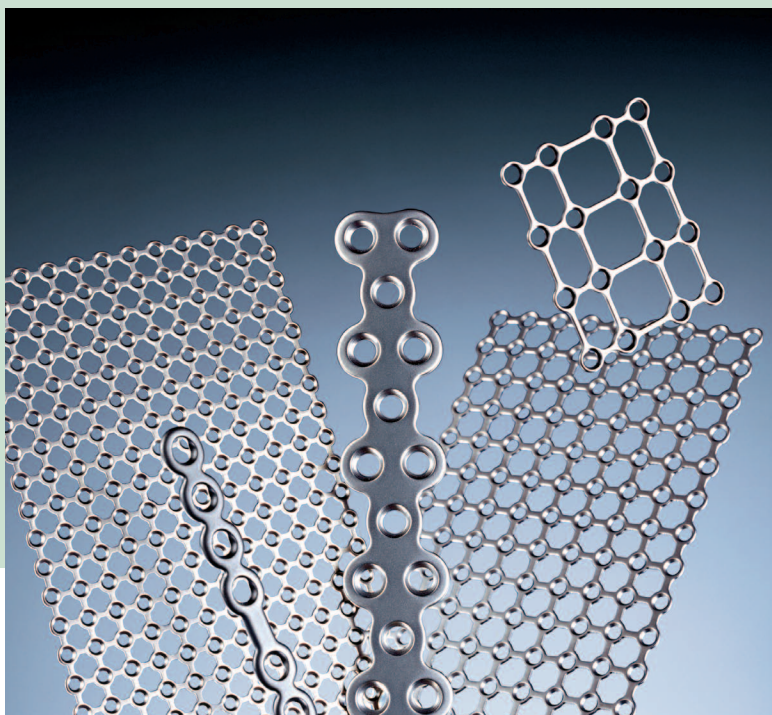


Welding.

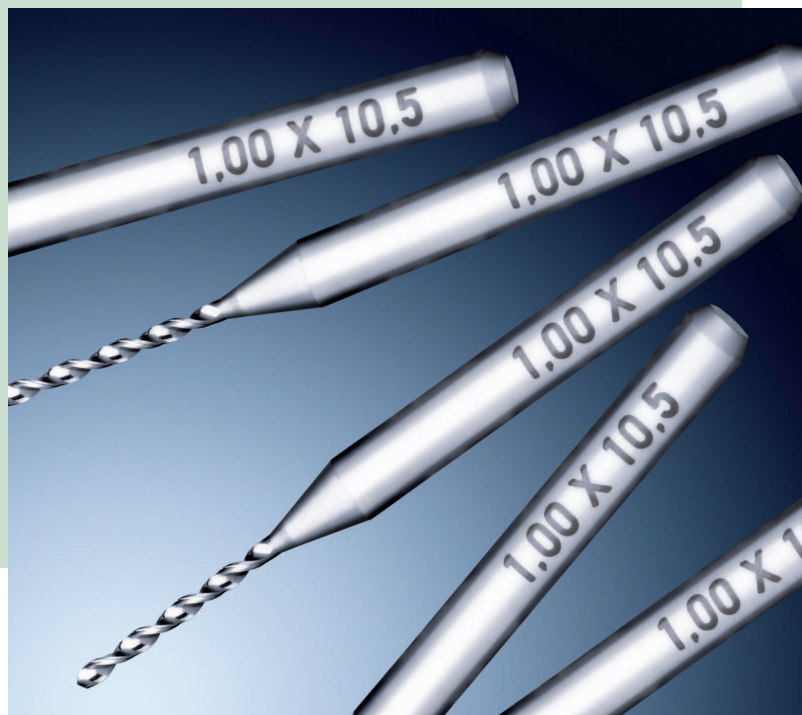
In the manufacturing of endoscopes, medical instruments and implants, TRUMPF lasers work with speed, precision and repeatability. The parts they produce are of the highest quality because lasers have the perfect prerequisites for welding, cutting and marking all materials traditionally used in medical technology.

Decades of experience.

Since as far back as 1973, leading producers of medical technology have confidently selected TRUMPF lasers for the manufacturing of their products. Our many years of experience, combined with ever more modern and innovative products and the highest reliability have turned TRUMPF into a global leader in the production of industrial lasers and laser systems.



Cutting.



Marking.

We are there for you.

With our outstanding services, we offer you comprehensive support around the globe – before the sale and long after it. Thorough consulting before your purchase includes feasibility studies performed at one of our Laser Application Centers.

Here we will give you a clear idea of which laser, which focusing optics and which parameters are needed to optimize your application.

Laser and operator training courses specifically tailored to your requirements are available anytime. For installation and start-up, you have our experienced application technicians at your disposal. If any questions should arise during operation we can access all data through telepresence, identify any issues and resolve them immediately. And there are many more services available to you – all over the globe. Just give us a call.

Perfect for surgical instruments.

It's with cutting, welding and marking of instruments for surgical applications that the laser excels. It works with the highest quality, offers numerous application possibilities for a wide variety of products, and is ideal for small and quick-changing batch sizes. This is because the laser has no wear and tear and requires no tool changes; set-up is limited to programming the control. With most applications no refinishing work is required.

Welding with high speed and precision.

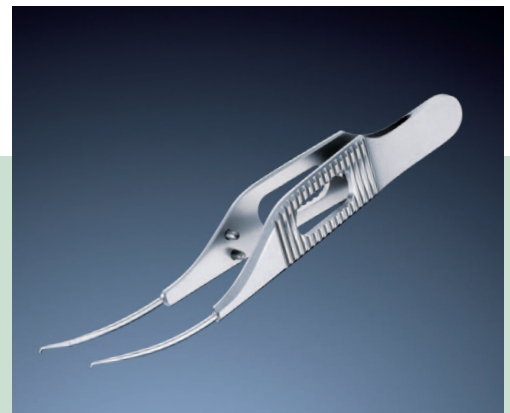
The extremely limited heat input enables even thin materials to be processed precisely without any distortion. You can often perform several welds in a single clamping fixture on endoscopes, for example, or when attaching intakes and connections. If you share the laser beam through several laser light cables you can weld tube to tube connections simultaneously at the endoscope shaft, and the tubes do not distort. The weld seams are pore-free, sterile and biocompatible, like the basic material – even if you weld with wire to fill a gap or to create smooth surfaces.



Retrieval basket made from nitinol: spot-welded.



Bone reamer for hip joint acetabular cup:
marked and cut.



Tweezers: welded and cut.



Quality for every cut.

The ability to produce smooth, clean-edged cuts at any angle with minimal burrs, surface roughness of just a few microns and equally small heat-affected zones, make lasers perfect for the production of surgical instruments. They enable the smallest radial cuts on trocars and endoscope shafts, and open thin-walled tubes with form cuts. They also cut contours on tweezers and scalpel tips. In addition, they can be used to create recesses on bone mills and drills, and from simple tubes they cut plain coil chains, e.g. for moveable guide instruments.

Permanent product marking.

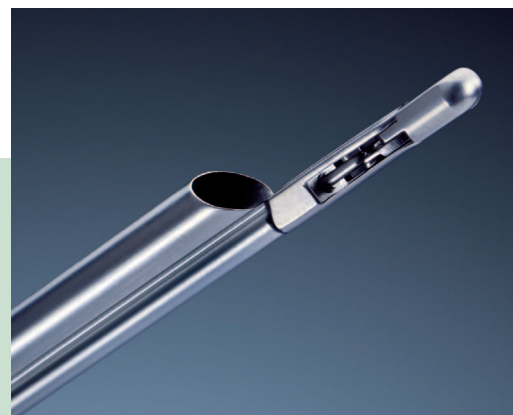
A laser beam, with its constant high quality, creates all marks, images and even data-matrix codes easily with annealing colors in the material. The surface does not change and can be sterilized at high temperatures. No other method achieves this so easily.



Neurosurgical cutter: marked.



Endoscope: welded and marked.



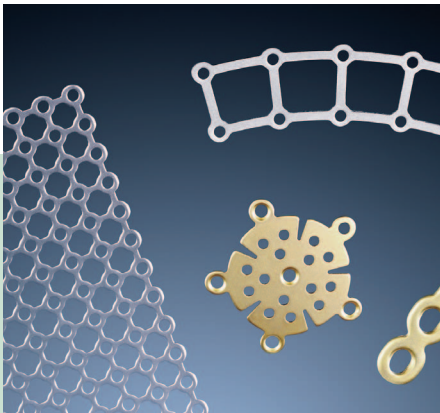
Endoscopic tongs: welded and radially cut.

Benefits for passive and active implants.

Implants welded, cut or marked by a laser are especially durable and biocompatible. Active implants can also be designed to be very lightweight and small.

Extremely precise welding.

Making titanium pacemaker housings air-tight is no problem for a laser. The electronics inside are never heated to more than 122 degrees Fahrenheit (50 degrees Celsius) and there is absolutely no weld splatter inside, because the welding depth can be adjusted with precision and the heat from the overlapping weld points is distributed across the entire housing. This enables the production of, defibrillators and pump implants as well as their electrodes and electronic components, for example. The clip sections of aneurysm clips for neurosurgery can also be welded without distortion. Their form and contours are perfect, and the laser even smoothes out the weld seam.



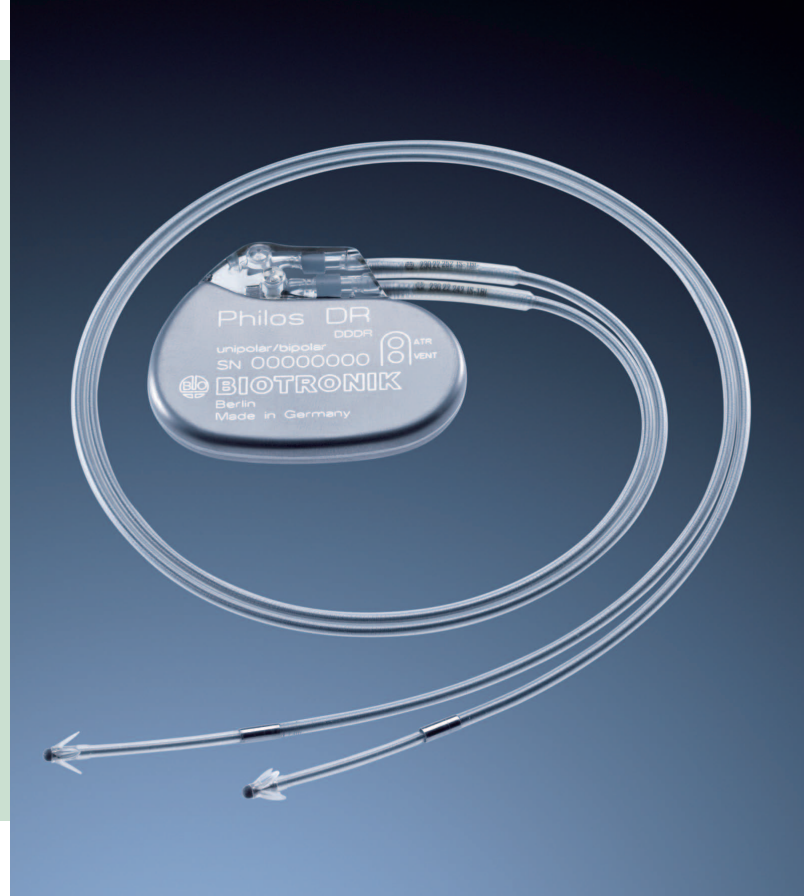
Titanium implant systems: cut.



Wrist implant: cut and marked.



Laryngeal membrane: welded.

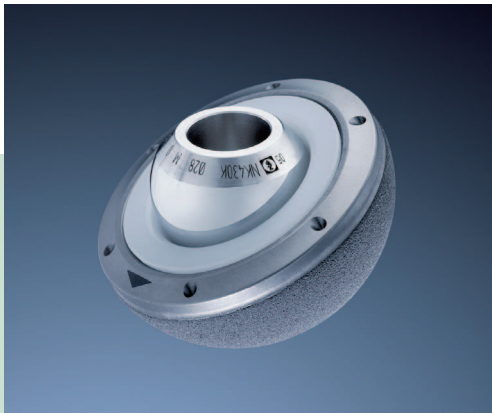


Cutting without refinishing.

Laser cuts have such smooth surfaces, minimal burrs and sharp edges that refinishing work is virtually eliminated. In addition, as a tool, the laser is extremely versatile: no tool changes are needed and set-up only requires the CAD/CAM data to be transferred. This has been proven not only with implants for orthopaedics but, also with titanium implant systems for surgery of the jaw, face, hand and spine.

All the marks for traceability.

The tiny, extremely sharp laser pulses enable all types of marks including logos, lettering, serial numbers and data-matrix codes. This guarantees complete traceability of patient-specific data – on a long term basis.



Head and acetabular cup of hip prosthesis: marked.



Implantable prosthesis rod for the hip: marked.



Femoral implant: marked.

Laser systems:

The uncomplicated way
to higher
quality.



Set up less, produce more.

TRUMPF laser machines are not only highly versatile in application, they are also economically efficient even with the smallest of batch sizes. Machine set-up only takes a moment, and all CAD data is simply transferred to the machine control. Set up of jigs and fixtures can be monitored by camera, and so can the contour tracing. This enables you to produce single pieces without a previous sample. The processing data saved in the machine can be retrieved anytime.

Adapted to your individual tasks.

Using a laser light cable you can combine all of our laser machines with the solid-state laser that suits your individual application. Generous working areas and CNC axes with travels up to 39 x 20 x 16 inches (1000 x 500 x 400 mm) will handle all of your tasks.

For example, for the welding of several endoscope intakes in one clamping fixture, we offer you additional turning and swiveling axes. A swiveling focusing optics and machines with rotary indexing tables are also available.



Endoscopic components: 3D welded.



Endoscope shaft: simultaneously welded and 3D cut.



Bronchoscope: inner tube, welded.



Easy-to-operate laser workstations.

At a TRUMPF laser workstation you can perform complex welding jobs by hand with the greatest of ease. The workpiece can also be moved with a motorized axis, making things even simpler.

Setting new standards.

With the compact and ergonomic TruLaser Station 5004 you can adjust the view into the microscope to suit your own requirements. Your posture does not have to depend on the size of the workpiece, because the microscope is uncoupled from the laser optics. The workpiece itself remains still as the joystick-controlled laser beam moves.

The laser as well as the exhaust unit are integrated into the housing of the TruLaser Station 5004 and welding takes place with full laser safety when the door is closed. In addition to purely manual welding, the control also monitors three linear axes and an additional rotary axis. All four axes can also be programmed using the Teach-In method.

You can also customize the design of your laser workstation. Monitoring as well as focusing optics from TRUMPF can be easily integrated. The focusing optics is then connected to the laser unit with a laser light cable.



Trocar: welded.



Endoscopic instrument: welded.



Clip forceps: spot and seam welded.

Marking lasers:

For
lasting
traceability.



High mark variety and quality.

The advantages of TRUMPF marking lasers are significant. The lasers create extremely sharp, non-abrasive and lasting marks – words, numbers, images or data-matrix codes. They process most materials without changing the surface and the materials remain biocompatible as well as sterilization-resistant. Our lasers are environmentally-friendly in operation, requiring no additional materials. The excellent depth precision also enables marking on tube surfaces without moving the component.

For metals and plastics.

TRUMPF offers you marking lasers with three different wavelengths, enabling ideal results with different materials. With metals, the laser beam creates annealing colors with localized heating, and the surface remains smooth. With plastics, the laser changes the color of layered pigments, and the surface remains unaffected. The laser itself is supplied as a compact component for integration or as a workstation solution.



Surgical scissors:
marked with data-matrix code.



Titanium screw for spinal implant:
marked with logo.



Plastic cannula: marked.

Micro-processing:

Entirely
new
perspectives.

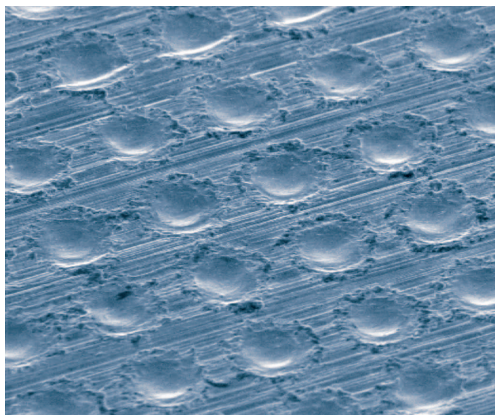


You have complete freedom.

Whether you have to drill blind holes into microneedles, structure or cut stents, improve the osteointegration of implants or mark glass ampoules with data-matrix codes: all of this and a lot more is possible with the new TRUMPF lasers for micro-processing. Our short and ultrashort pulse lasers process different metals, semi-conductors, ceramics and glass.

Less heat input and refinishing.

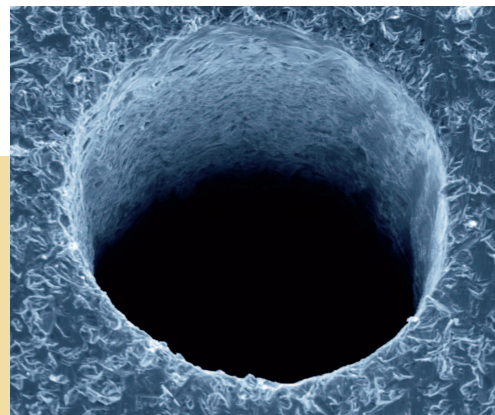
A laser beam with a spot width of just a few microns, and high energy pulses that can be shorter than 10 picoseconds make your processing especially fine and precise. This reduces the need for refinishing and keeps costs down. At the same time you can introduce entirely new functions or structures in the micron range – for innovative products. As always with TRUMPF, all laser parameters can be controlled – pulse energy, average power and repetition rate.



Stainless steel: structured, 40 microns wide, 5 microns deep.



Stent: ablated and cut.



Drill hole in tungsten: 200 microns deep, diameter 75 microns.

TRUMPF is certified according to DIN EN ISO 9001 and VDA 6.4