



Ultra-short pulse laser

Medical devices are subject to strict traceability in order to exclude counterfeits, maintain quality standards and ensure accurate identification. This is only possible through specific and individual labelling of implants, medical instruments, pacemakers, tubes and other medical devices. Because of the different materials, this requires not only sensitivity but also a good understanding of the product. Ultra-short pulse lasers are ideally suited for this task.

The lasers emit ultra-short light pulses that offer high precision and thus meet the particularly high demands of medical technology. With a pulse duration of picoseconds, not only filigree markings can be carried out, but also materials with the smallest structures can be precisely processed. Compared to other marking methods, this process offers the advantage that neither ink nor other solvents are required. The quality is consistent and, the procedure is fast and precise when processing materials such as metal and plastic.

It is also crucial that the surface structure is not attacked or changed during this technological process. Ultra-short lasers are able to prevent material damage such as corrosion or structural changes.

But how does it work? Especially with lasers that process materials in the nanosecond range, the absorbing material inevitably experiences strong heating. This not only complicates the marking of sensitive materials, but in some cases makes it completely impossible. Ultra-short pulse lasers, on the other hand, work in the picosecond range, which keeps the heat development low despite the enormous pulse power, because the time is not sufficient to heat the material surface.

Ideally, the material is converted directly from its solid state to a gaseous state at the point where it is hit by the laser. This significantly reduces burr formation. Performing marking and material processing using an ultrashort pulse laser allows a wide range of materials to be marked thanks to the gentle, cold laser marking and thus opens the door to new fields of application. Increased precision, less damage to adjacent material areas, maximum detail accuracy of the markings and a high surface quality are the results of laser technology.

Exciting technological approaches

- ◇ **Company:**
ACI Laser GmbH
- ◇ **Product:**
DFL Brevis Marker
- ◇ **Technology:**
Ultra-short pulse laser
- ◇ **Advantages:**
Fast, precise, no use of paints or solvents, enables processing of smallest structures without damaging the surface, durable, chemically resistant
- ◇ **Fields of application:**
Labelling of highly sensitive materials in medical technology
- ◇ **Website:**
<https://www.aci-laser.de/>

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