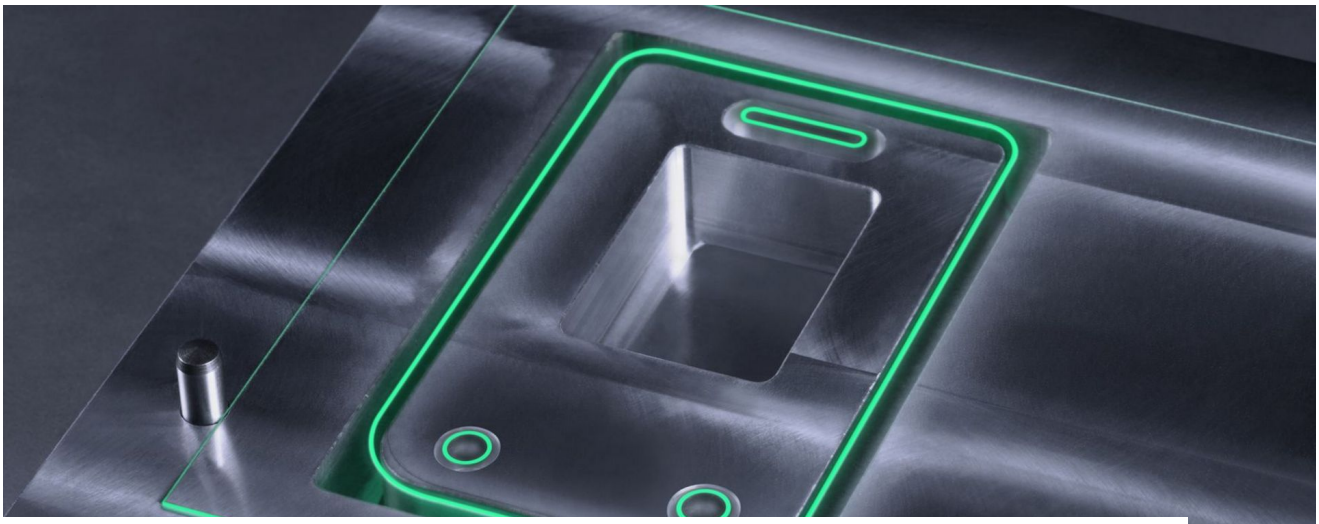

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Nobel Prize-winning technology in use at TRUMPF

At the Laser Application Center, TRUMPF demonstrates what's possible with the Nobel Prize-winning CPA technology.

On October 10, 2018, the time finally arrived – Gérard Mourou and Donna Strickland received the Nobel Prize for Physics in Stockholm. The prize was awarded for their method for very short and extremely powerful laser impulses, known as CPA technology (chirped pulse amplification). This technology is already being used for ultrashort pulse lasers (USP) from TRUMPF. Whereas normal lasers melt steel, no heat is produced in the material that is being processed using the Nobel Prize-winning method. This is known as "cold processing". Ultra-smooth cuts, such as the ones needed for smartphone displays, are only made possible by this.

TRUMPF cuts glass with USP lasers

The special thing about USP lasers is that they don't heat up the material. This means that delicate materials can be carefully processed. Even cutting glass is no problem. In this process, bursts of ultrashort laser light in the femtosecond range force the transparent glass to absorb several photons at once. Termed multi-photon absorption, this method considerably improves absorption of the incident laser light. The glass absorbs the energy of the laser in trillionths of a second, the moderate energy making only localized changes to the processed material. TRUMPF developed the TOP Cleave process, a method that harnesses these precisely measured laser impulses to make exact cuts in glass materials. Christoph Neugebauer, head of TRUMPF's Micro-processing Lab, explains how this works.

TRUMPF

TRUMPF TruMicro lasers use award-winning laser technology to cut glass.

USP lasers from TRUMPF in use worldwide

The USP lasers of TRUMPF's TruMicro 2000 and TruMicro 5000 Femto Edition series operate on the principle developed by Mourou and Strickland. In recent years, TRUMPF has marketed a four-digit number of USP laser systems internationally. The high-tech company's USP lasers are deployed mainly in microprocessing applications, in the manufacture of electronic components, and in glass welding.



Gérard Mourou

More than anyone else, Gérard Mourou is synonymous with the concept of extreme light. He was the driving force behind the establishment of high-performance laser centers around the world, he recently launched ELI, a major European project focusing on extreme light infrastructure, and he has built up an international community of scientists in this field. Mourou has received numerous prizes for his work, including the renowned Berthold Leibinger Research Award for applied laser technology in 2016. TRUMPF sincerely congratulates the Nobel prizewinners for physics.



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