

LidroCUT®

Semiconductor equipment

- Made in Germany



„More than Moore“

This new motto is behind many current innovations in microchip technology. Instead of designing chips to be smaller and smaller, the aim today is to enable more functions and higher efficiencies in the integrated circuits. The separation of chips plays a central role in this and the requirements continue to grow. Lidrotec has optimized its **precision cutting process in liquids for cutting semiconductor wafers** and named it **LidroCUT®**.



Lidrotec GmbH, based in Bochum, Germany, was founded in 2021 by experts in laser technology. It is the first company to offer the innovative technology of wafer dicing using lasers and liquids.

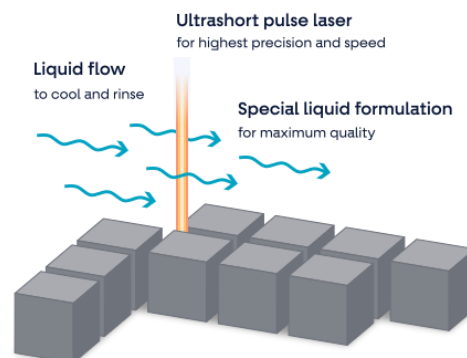
Since the start of mass production of semiconductor chips in the 1960s, the question has arisen as to which method can be used to efficiently cut the thousands of microchips produced side by side from their carrier substrate (wafer). In the vast majority of cases, the answer so far has been the diamond saw process. However, the mechanical forces at the hairline saw gap lead to undesirable side effects: The cut edge is weakened by micro-cracks and shell breakouts, which can spread to the heart of

the chip even during the final processing steps or under operating conditions of the microchip and thus lead to premature failure.

The company *Lidrotec*

Lidrotec GmbH has developed the first future-proof flexible alternative for the diamond saw with its laser precision cutting process in liquids. The process is based on the combination of an ultra-short pulsed laser with specially designed liquids, which solves the biggest challenges of both the saw and other laser processes:

- 1) The 1000x better heat conduction of the liquid in contrast to the gas atmosphere reduces the thermal stress on the cutting edge.
- 2) The special liquid safely removes all micro- and nanoparticles from the chip surface, so that no deposits are formed.
- 3) A particular advantage of the ultra-short laser pulses is their high material compatibility, so that even composite systems with very different materials can be cleanly separated.



There is a very large potential for Lidrotec in the semiconductor market. When cutting silicon wafers, both a **higher edge quality** and thus better resistance are achieved, as well as **narrower cutting widths** in combination with a reduced crack-stop, so that more chips can be placed on each wafer.

In the new semiconductor markets, such as **silicon carbide, gallium arsenide and indium phosphide** wafers, the gentle cutting process shows its full strength. The greater brittleness of these new materials currently leads to very high reject rates of up to 10 percent when separating with the diamond saw. These can be reduced to zero by using the new process.



Another interesting area of application is **3D integration (chiplet)**, in which similar or different microchips are spatially connected next to or on top of each other. Highest edge quality and clean surfaces without nanoparticles and microparticles as well as burr-free cut edges are important basic requirements for this type of functional integration and are achieved by laser cutting in a liquid environment.

As a young company in the semiconductor industry, Lidrotec enjoys the growing demand for a new and innovative separation technology to solve the current challenges.

The first turnkey machines from Lidrotec will be delivered from the end of 2023.

- » Reduce your material, process and production costs
- » Increase your productivity
- » Reduce your manufacturing complexity
- » Produce more sustainably
- » Develop new and more efficient product designs

Would you also like to convince yourself of the advantages of laser processing in liquids? We would be happy to carry out feasibility studies, demonstrations and job shop for your individual applications. We also have the right products for the use of LidroCUT® technology in your own production.



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