Innovation for Life Science Laboratories

ARRALYZE

LPKF
Laser & Electronics

ARRALYZE for Life Science Labs

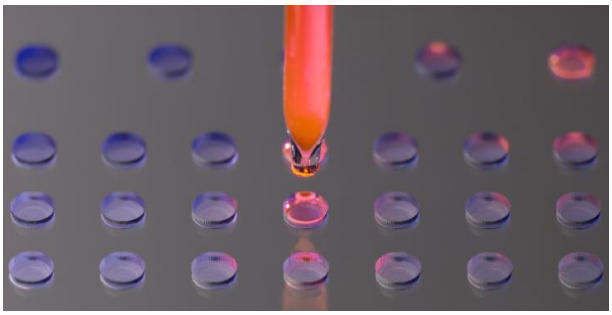
LPKF sets miniature standards not only in the field of PCB prototyping. With its strong expertise in laser technology, LPKF also achieves very precise processing of thin glass using LIDE© technology. And this is now being applied to the life sciences.

LPKF's patented Laser Induced Deep Etching (LIDE) enables modifications to be made across the entire thickness of the glass using individual laser pulses and thus makes it possible for deep structures such as through-holes or micro-cuts to be created. No special glass is required, and the processed glass remains free of chipping or microcracks. On the one hand, LIDE-processed glass is used in electronics, such as display production and IC packaging and, on the other hand – and this is new – in the life sciences in pharmaceutical and biology laboratories.

In the life sciences, the separation of cells, DNA and other biological materials is an important process, especially for high-throughput experiments. Vessels made of plastic or, more recently, microfluidic methods are usually used to carry out several hundred to several million experiments. Due to the high cost of the reagents and the often small amount of available biological material, most laboratories prefer to work with small volumes of the individual reaction vessels.

Droplet technology and its difficulties

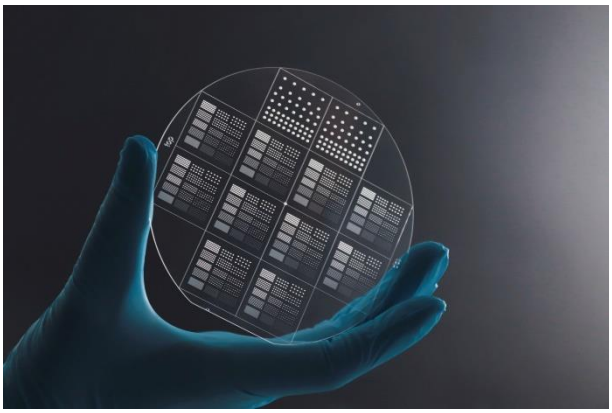
In recent years, the so-called droplet technology has experienced enormous progress in the investigation of biological materials for high-throughput screening due to the high degree of parallelization possible. Droplet technology is a microfluidic process. The sample to be examined is enclosed in an aqueous drop in an oil phase. Under certain circumstances, however, this technology has disadvantages, such as possible undesirable diffusion processes between individual droplets and the oil phase. Another disadvantage is the generally poor transferability to in vivo conditions. For lack of alternatives, however, these disadvantages are accepted in many experiments. Qualitative limitations in the production of very small structures in plastic or glass have so far been a further obstacle. However, glass is particularly suitable in this context, as it is very inert towards biological samples and its optical transparency allows for versatile microscopic analysis.



The glass cavities that can be produced with LIDE require very small sample volumes ranging from picoliters to nanoliters.

The solution

With the help of LIDE© technology, limitations such as those mentioned above can now be overcome. It is finally possible to realize thousands to millions of tiny structures in high quality on the smallest surface in glass. These so-called arrays or biochips have recesses with diameters ranging from 5 µm to the millimeter range and allow experiments to be carried out with volumes in the nanoliter range.

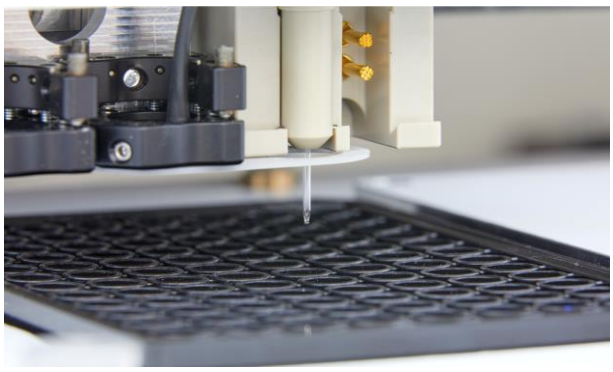


Glass wafer with arrays

The glass arrays are offered by LPKF under the brand name ARRALYZE together with a workstation which can handle the arrays natively. It is equipped with precision tools to fully exploit the possibilities of glass arrays. This includes, for example, precision-operating print heads for printing biomaterial, reagents and also living cells specifically into the recesses. Microscopic capabilities make it possible to document the progress of the experiments live at the workstation. High-accuracy tools for extracting the cells make it possible to isolate particularly interesting or powerful living cells after screening and to continue working with them.

The ARRALYZE workstation incorporates LPKF's many years of experience - the workstation is based on the proven ProtoMat systems.

The extensive equipment of the ARRALYZE workstation with print heads, capillaries and optical inspection components, in combination with the possibility to customize the ARRALYZE glass arrays, enables a wide range of applications. Thus as an innovation for life science laboratories, ARRALYZE supports research. With the smallest features, extensive design freedom of the arrays and precise handling, the ARRALYZE workstation is a valuable tool for many life science laboratories.



Gentle and fast handling of biomaterials: The ARRALYZE Workstation offers fully automated drop calibration and allows the printing of living cells.

Areas of application

- (Single) cell experiments
- Development and testing of pharmaceuticals
- 3D cell cluster experiments
- Cell line development
- Production of monoclonal antibodies
- Generation of genome and cDNA libraries
- Digital polymerase chain reaction (dPCR)
- Individual analysis tasks

Further information about this system and contact persons can be found under: www.arralyze.com

Contact information LPKF:

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