TopSpot® E Microarrayer

The TopSpot® E is a cost efficient microarrayer for low and medium throughput. It utilizes the superior TopSpot® non-contact printing technology for low and medium density microarrays. The manual loading of slides and printheads makes it a very attractive microarrayer for research and laboratories.

A new microarray printer concept: TopSpot® E offers a flexible stand-alone solution for microarray printing. The small size, the innovative non-contact printing technology and the competitive price make it ideal for decentralized use and saving time and trouble for laboratory staff and scientists.

Features

The system comes fully equipped and ready to use. It includes the printer, a 24-channel printhead, the control software, printhead cleaning station and accessories. Depending on the application and throughput, you can use 24- and 96-channel printheads. Both print low- and medium density microarrays.

All printheads are reusable and easy to clean.

„For applications in pharma research we need a non-contact spotting device that prints highly parallel and allows to perform an entire printing job with just a few microliters of sample. The TopSpot® technology combines all these features.“

Dr. Gregor Dernick
F. Hoffmann-La Roche Ltd., Swiss

„Non-contact printing enables printing on a wide range of substrates without damaging the surface e.g. evaporated gold coatings, polymer membranes and even hydrogel coated surfaces.“

Dr. Richard B.M. Schasfoort
MESA+ Research Institute, University of Twente, Netherlands

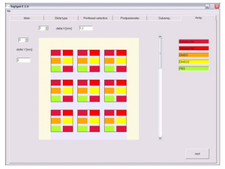
TopSpot®E Microarrayer

BioFluidix GmbH
Georges-Koehler-Allee 106
79110 Freiburg
Germany

Tel. +49-761-203 7282
Fax +49-761-203 7284
www.biofluidix.com

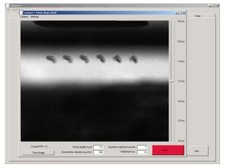
TopSpot® GUI Software
easy to use array design

Printhed selection



Sub-Array design

TopSpot® E Vision
inline quality control

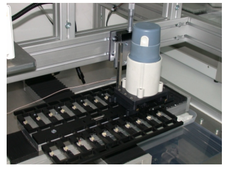


DropCheck function

SpotCheck function

TopSpot® OEM
for system integration

OEM print module



OEM application example

Customer Service
BioFluidix equipment utilizes long lifetime parts, which increase significantly the up time of the system. The TopSpot® E requires minimal maintenance and in case of a problem BioFluidix offers world wide customer service through its local distributors.

TopSpot® Microarrayer

- Non-contact printing technology
- Highly parallel probe spotting
- Multitude of print media

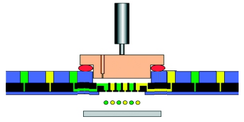
„...using the advantages of non-contact printing the TopSpot® technology provides a very homogenous distribution of capture reactive groups across the entire spot surface when using the right printing and environmental conditions..."

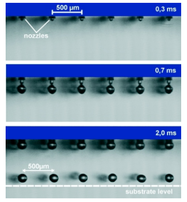
Prof. Dr. Dietmar Blohm

University of Bremen

Piezo actuator system

In order to print samples, TopSpot® applies pressure to the liquid filled nozzles. A piezo stack actuator presses a stamp into the so called actuation chamber of the printhead. The stamp is a piston, which is sealed with an O-ring to the surface of the printhead. When the piston drives down into the actuation chamber, it creates a homogenous pressure pulse that simultaneously affects all the nozzles. If the pressure is high enough, it overcomes the capillary forces of the channels and the surface tension of the fluids in the nozzles. When this happens, the printhead accelerates the fluid and the nozzle dispenses a droplet. For a better and more homogenous ejection of the droplets, the nozzles area is uniquely coated with a hydrophobic silane. This allows for a droplet ejection like shown in the picture below.





User-friendly Software

The TopSpot® instruments require a standard laptop or desktop computer with the following system requirements:

- USB 2.0 port
- WINDOWS 2000, XP or Vista

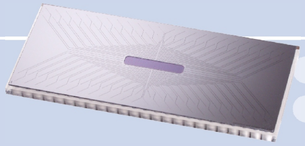
The TopSpot® E software is easy to use and highly flexible. The following menus simplify the operation and design of microarrays:

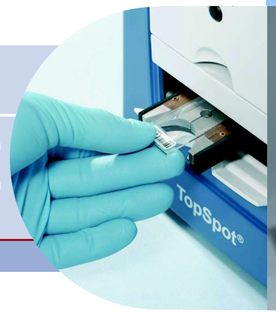
- system initialization
- printhead selection
- printhead parameters
- array design
- sub-array design

„This accurate technology is easy to use. Fabrication of high quality microarrays is performed after even one day of initial training. The technology works without carryover and without cross-contamination."

Prof. Dr. Günther Gauglitz

University of Tübingen





TopSpot® Benefits

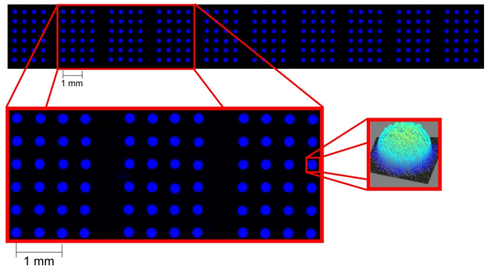
Core technology

The TopSpot® technology is optimized for highly reliable, robust and fast printing of microarrays. Due to the design, the technology is fully scalable from low to high throughput requirements. The micro fabricated printhead and the piezo actuated print mechanism are the integral parts of the new, innovative microarrayer.

Micro-fabricated printhead

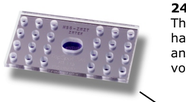
The core of the TopSpot® technology is the micro fabricated printhead. The printhead consists of three layers, which are manufactured with litho-graphic techniques. The top layer contains either 24 or 96 reservoirs for the sample fluids. The distance between the reservoirs is standardized at a 384 well-MTP format.

This enables filling of the reservoirs manually by a pipette or automatically with a liquid handling robot. Due to the minimum dead volume of the printhead, the loss of expensive sample is very small (max 0.4 µl).

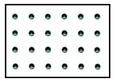


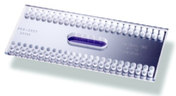
Advantages of the TopSpot® Technology

- high reproducibility
- array integrity
- correct size
- high spot quality
- spot morphology
- spot integrity
- signal/noise ratio

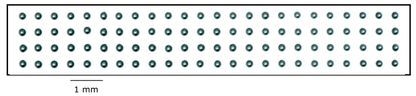


24-channel printhead
This is the standard printhead. It has 24 reservoirs for sample fluids and a nozzle-pitch of 500 µm. Uptake volume between 1 and 5 µl.





96-channel printhead
This is the upgrade printhead. It has 96 reservoirs for sample fluids and a nozzle-pitch of 500 µm. Uptake volume between 1 and 3 µl.



The quality and homogeneity of each spot, from the first to the last in one run, is unsurpassed.

Applications

The TopSpot® E microarrayer works with a wide variety of print media, proving ist versatility.

- **Nucleic acids**
  - oligonucleotides
  - cDNA
  - plasmids
- **Proteins**
  - BSA
  - antibodies
  - antigens
  - DNA-protein complexes
- **Cells**
  - living cells
  - cell lysates
  - lipids
  - sugars
- **Buffers and Solvents**
  - salt solutions up to 0.5 M
  - SSC / PBS / carbonate buffer
  - DMSO
  - glycerol, up to 30 % v/v
  - betaine
  - Nonidet®
  - nano particles

The new and innovative TopSpot® microarrayer family introduces unmatched advantages. Its non-contact printing technology has several built-in benefits like a high spot quality and a wide range of print media. Due to the fast and precise printing mechanism, the highly reliable mechanics and easy-to-use software it is best in its class.

Easy to use and time efficient

The integrated concept and the userfriendly design of printer and software allow operation after a short training period. No specially trained staff is required to achieve optimum results.

High Print Quality

The viscosity and the surface tension of a fluid are the major factors, which impact the droplet dispensing process. Intensive research has been conducted to determine the optimum conditions for a stable and satellite free droplet ejection for different printing media.

High Throughput

Once the system is set up and the printhead with 24 or 96 channels is filled, several thousands slides can be printed in one run.

Reproducible results

The high print quality with consistent spot size and form ensures best results in testing and no loss of time for repeating failed tests.

Fast and reliable operation

The high mechanical quality of the printer guarantees speed and reliability over a long period of time.

Low use of sample fluid

The TopSpot® technology reduces loss of sample fluid by a minimum dead volume. In this waya more slides can be printed with the same filling.

Wide range of print samples

The non-contact printing technology allows to print a wide range of samples on different carrier materials.