

LAB-ON-A-DISC - AUTOMATED PRODUCTION OF MICROFLUIDIC SYSTEMS

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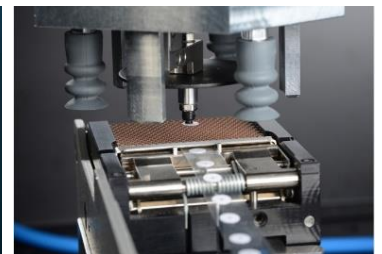
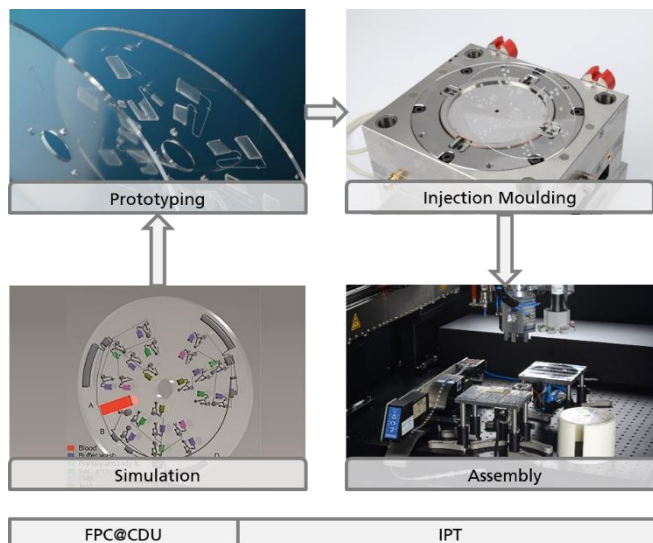
INTRODUCTION

Microfluidic systems make it possible to reliably determine personal values for medical diagnostics in a user-friendly way, without much effort or functional knowledge. One example of such an application are Lab-on-a-Disc systems (LoaDs), in the course of which the necessary functional scope of a laboratory is recorded on the size of a compact disc.

INNOVATION

The **Fraunhofer IPT** cooperates with the **Fraunhofer Project Center at Dublin City University (FPC@DCU)** on the implementation of the LoaDs. Their experts design the layout of the necessary structures, optimize existing LoaDs with the help of simulations and create prototypes for functional tests. **FPC@DCU** thus accompanies the implementation from an idea to the finished, digital LoaD system. The unique selling point is the specially developed membrane technology which enables the implementation of highly complex, multi-layered investigations on a disc. Possible applications are for example:

- Vitro Diagnostics
- environment monitoring
- Biopharmaceutical process monitoring
- Diagnostics in the agricultural sector



PRODUCTION

The **Fraunhofer IPT** has the possibility to produce the discs up to a medium quantity for research purposes. An injection moulding process is used which ensures a consistently high level and low cycle times in replication. The specially developed variothermal embossing tool with exchangeable mould inserts allows the production of different microfluidic systems.

Thanks to the **Fraunhofer IPT**'s many years of experience in the field of ultra-precision technology, structures in the micrometer range can be used up on the mold inserts and finally replicated. After injection moulding, the LoaDs are fitted with various function-enhancing components, such as diaphragms, during assembly. In order to meet the high demands on the position accuracy of the components, the assembly cell was equipped with specially developed tools, which also leads to a high degree of adaptability to future processes.

Furthermore, a final lamination process is planned using roll-to-roll systems to seal the LoaDs.

CONCLUSION

The joint venture between Fraunhofer IPT and FPC@DCU covers the complete spectrum for the manufacturing of microfluidic structures from layouting over prototyping until small-scale production.

OUR PARTNERS

