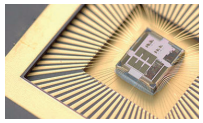
Hahn-Schickard

Intelligent solutions with microsystems engineering

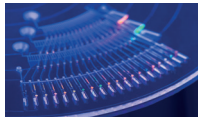
Sensors and actuators
> Custom-tailored sensor and system solutions for various parameters
> Pumps and dosing systems



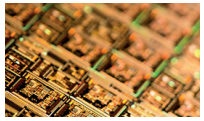
Integrated microsystems
> Sensor fusion
> Energy autonomous systems

Cyper-physical systems
> Smart factories
> Industrial Internet

Lab-on-a-Chip + analytics
> Integration, parallelization, and automation of biochemical analyses

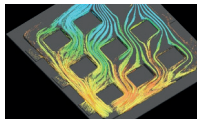


Microelectronics
> Evaluation circuits for your sensors with ultra-low energy consumption



Micro assembly + packaging
> Mechatronic assemblies
> Functional microstructures via modern digital printing techniques

Modeling + reliability
> Numerical simulation and optimization of your products



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05.2016

Hahn Schickard

Lab-on-a-Chip Design House + Foundry

Visions to Products

Assay Integration

Automation and miniaturization of biochemical assays
The Lab-on-a-Chip Foundry offers a shortcut to lab-on-a-chip solutions, reducing development risks and costs. We integrate your assay in functional lab-on-a-chip prototypes within one month. Our service includes all steps starting from specifications, design, simulation and prototyping up to functional testing in our S1 and S3** labs. This allows you to quickly evaluate lab-on-a-chip technology for your application without major investments, greatly simplifying product development decisions. Assay integration will be performed on the most suitable microfluidic platform, depending on your needs.

> Our centrifugal **LabDisk** and **LabTube platforms** are operated on centrifuges and do not require pumps or interconnects. This enables low cost fabrication and minimizes the risk of cross-contamination.
> Our **pressure-driven platform** is advantageous for continuous sample injection and processing.

Available demonstrators for multiple assays
> Nucleic acid based tests (e.g. MRSA, B. anthracis, food pathogens).
> Immunoassays (e.g. IL8, estradiol)
> Enzymatic tests (e.g. cholesterol)
> Sample preparation, (e.g. DNA extraction)

Rapid Prototyping + Scalable Production

Standardized fabrication processes
We provide short turnaround times for the fabrication of your microfluidic prototype, meeting the demands for effective and fast development. We offer precision-micro-milled polymer masters as well as replication in polymer foils (diameters up to 130 mm in small batch series up to 1000 replications). In addition, we also modify or functionalize surfaces, provide solutions for pre-storage of reagents and sealing of microfluidic channels. Therefore, we cover the entire process flow from initial design to fully integrated lab-on-a-chip systems.

Master fabrication
> Precision milling + Soft lithography

Replication technologies
> Microthermoforming of foils
> Hot embossing
> Injection molding

Surface treatment
> Modification (hydrophilic or hydrophobic)
> Functionalization (proteins, nucleic acids)

Reagent pre-storage
> Liquid and dry reagents

Sealing of test carriers
> Thermobonding, adhesive bonding

Simulation + Consulting

Our expertise in simulation of microfluidic strutures enables our customers to better understand the behavior of their unit operations, and to develop straight forward optimization strategies. Simulations can be performed at certain development stages to support:
> Proof of principle evaluations
> Detailed analysis of liquid behavior, diffusion or binding kinetics
> Design optimization of microfluidic structures

Depending on the operation to be simulated, we use highly spatially resolved computational fluid dynamics, a network modeling approach or a combination of both to predict or analyze:
> Pressure losses
> Velocity profiles
> Diffusion and coupled convection diffusion processes
> Heat transfer
> Dynamics of free surfaces
> Reaction kinetics

Outsourcing your lab-on-a-chip development to Hahn-Schickard offers the chance to take advantage of a widespread partner network comprising experts in mass production, medical device manufacturers, and partners for clinical validation.