



Fraunhofer

analytica, April 1–4, 2014, Messe München

NEW TECHNOLOGIES FOR ANALYTICS AND DIAGNOSTICS



NEW TECHNOLOGIES FOR ANALYTICS AND DIAGNOSTICS

“made by Fraunhofer” innovations cater to the customer’s needs, ranging from feasibility studies to prototype device development, analytical services and the relevant product approvals. Fraunhofer sees itself as a service provider able to support research and development projects and assist customers in taking their products through to maturity. Fraunhofer’s solutions make analytical processes more efficient, ease the strain of routine analytical tasks, and streamline the evaluation and interpretation of measurement data. The range of services includes high-speed, sensitive analytical methods based on electronic biochips, point-of-care protein-analysis devices, glucose and lactate biosensors, in-vitro diagnostic tests, and new segmentation and analysis techniques and systems based on multimodal cell imaging. Such techniques guarantee fast and sensitive analytical processes. Other biological or biochemical processes are analyzed using imaging techniques. Quality assurance is supported by the use of objective, image-based documentation.

Ten Fraunhofer Institutes are showcasing this broad range of services at analytica 2014.

To discover the Fraunhofer world of analytics, stop by **Hall A1, Booth 530/531!**

EXHIBITING FRAUNHOFER RESEARCH INSTITUTIONS

FRAUNHOFER INSTITUTE FOR APPLIED OPTICS AND PRECISION ENGINEERING IOF

Printed components for lab-on-a-chip systems

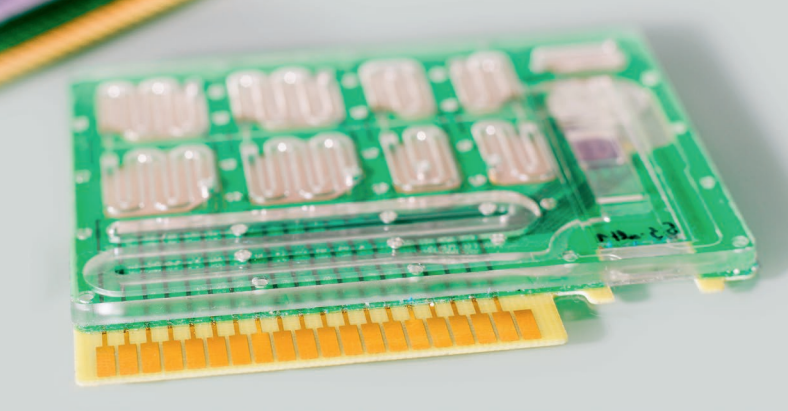
The exhibit features components produced by means of digital printing processes (inkjet). Lab-on-a-chip systems facilitate specific chemical and biological analyses using particularly small amounts of liquid for point-of-care applications. Inkjet-printed structures that are combined with replicated microstructures allow functionalities that are usually realized externally (e.g. pumping, temperature control) to be integrated on chips. This innovative manufacturing approach enables very flexible and cost-effective processing (disposable chips).

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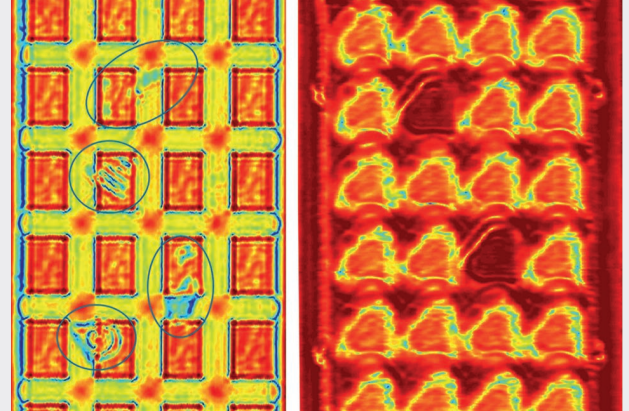


FRAUNHOFER INSTITUTE FOR BIOMEDICAL ENGINEERING IBMT

The Fraunhofer IBMT, Potsdam-Golm branch, offers long-standing expertise in molecular bioanalytics, cellular biotechnology, nanobiotechnology as well as cell-free protein synthesis. analytica exhibits include an egg-shaped capsule for autonomous biosensing in bioreactors, a credit-card sized cartridge for patient-near multiparameter diagnostics and a system for continuous cell density measurement that works without touching any cells. All technologies can be adapted to specific areas of application, and services and projects related to these topics are also available.

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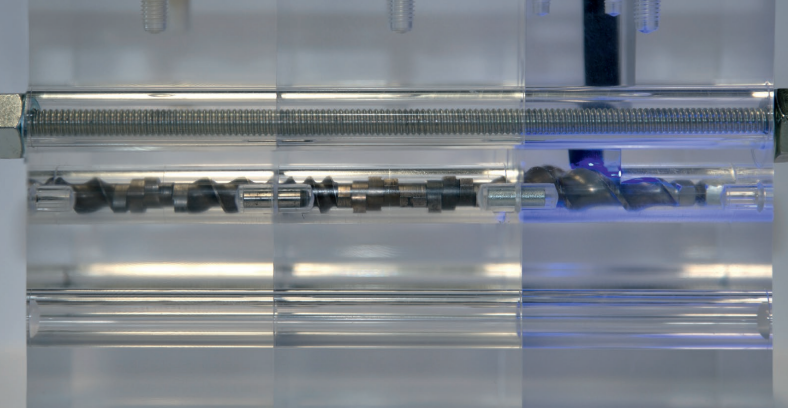
FRAUNHOFER INSTITUTE FOR HIGH FREQUENCY PHYSICS AND RADAR TECHNIQUES FHR

SAMMI – short for Stand Alone MilliMeter wave Imager – is a scanning system for testing materials for impurities, material flaws and processing variations. SAMMI can be used to scan non-conductive materials at millimeter wavelengths, and works by measuring the amplitude and phase of the electromagnetic wave. The system is compact, transportable and can be used flexibly in office and laboratory environments.

- Measuring system for contactless materials testing in industrial production
- Able to identify glass, plastic, film and metal impurities, the classification system can also identify if products are missing inside packaging

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FRAUNHOFER INSTITUTE FOR CHEMICAL TECHNOLOGY ICT

Glass extruders

Developing reactive extrusion processes for twin-screw extruders always requires comprehensive analytics in order to evaluate the success of the reaction and the influence of machine and process parameters. While there are various options available on the market that enable users to observe this in the process zone, each requires the process to be interrupted. Fraunhofer ICT's exhibit demonstrates the application of NIR spectroscopy in a twin-screw extruder process zone, specifically designed as a means to monitor reactive extrusions.

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Branch ICT – IMM

Fraunhofer ICT – IMM's focus in the area of Microfluidic Analysis Systems is the customer specific development of integrated, automated microsystems and components for medical diagnostics, environmental analysis, biological security applications, food quality control, industrial analytics and process control. With the help of micro-structuring technologies and model-based design we develop efficient biomedical diagnostic systems (lab-on-a-chip or μ TAS) for manifold applications.

- Standalone PCR module based on the moving plug concept
- High-precision syringe pumps with minimal pulsation
- lab-on-a-chip platform "Simplex"
- Fluidic chips for various analytical applications

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FRAUNHOFER INSTITUTE FOR INTEGRATED CIRCUITS IIS

Image analysis for brightfield and fluorescence microscopy

Fraunhofer IIS develops new methods and systems for digitalization and analysis of tissue and cells in microscopic images for applications in laboratory diagnostics and digital pathology. We are pleased to offer our services, which range from initial feasibility studies and data analysis for specific applications up to research and development projects (contract R&D) including support for regulatory affairs. The department maintains a certified quality management system according to ISO 13485.

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SCube – Modular scanning platform for microscopy

SCube is a modular microscopy scanning platform for laboratory automation, digital pathology and research applications. It allows automated scanning of samples in multiple magnifications with automated supply and identification of slides. High-magnification immersion microscopy is supported by an automatic oiling unit. An open software development kit allows fast development of custom applications.

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FRAUNHOFER INSTITUTE FOR MANUFACTURING ENGINEERING AND AUTOMATION IPA

Innovative automation solutions can help to optimize processes not only in the traditional production environment but also in research, testing and development laboratories. We develop automation solutions for these applications that cover everything from the design concept right through to short-run manufacturing.

Our key areas of expertise are:

- Automated devices and systems (device integration, CE, GMP)
- Liquid handling and related robotics
- Laboratory IT (PMS, GUI, standardization, SiLA, data-mining)
- Automated cell and tissue culturing (cell lines, stem- and primary cells, tissues)

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Project Group for Automation in Medicine and Biotechnology

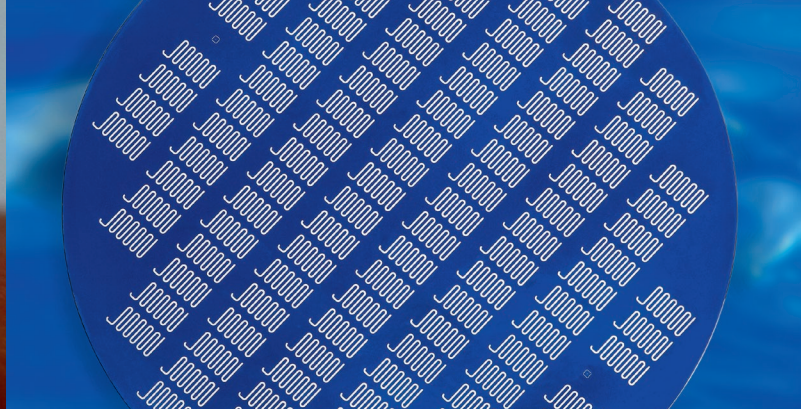
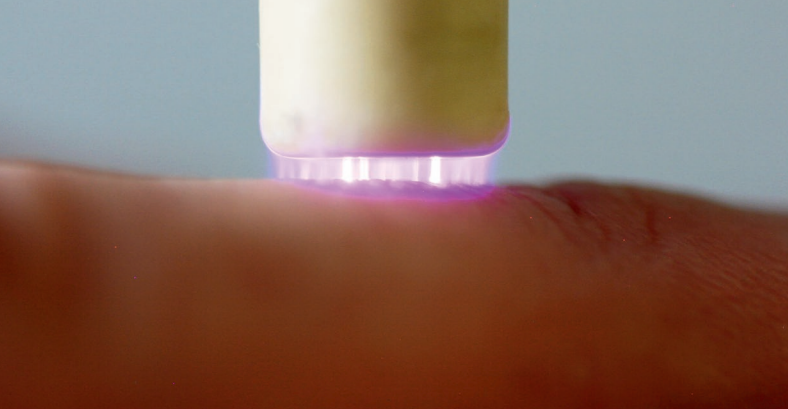
The Project Group for Automation in Medicine and Biotechnology at Fraunhofer IPA researches automation potential for medicinal and biotechnological application. Located at the heart of a university clinic environment, it offers a service portfolio that includes numerous development services. Fraunhofer researchers in bioprocess technology work with an interdisciplinary team to develop new automation solutions to support diagnostics and therapy. Magnetic beads and their numerous applications are the central focus of this work.

Exhibits at analytica include:

- Innovative magnetic separation technologies
- Diagnostics on magnetic beads

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FRAUNHOFER INSTITUTE FOR SURFACE ENGINEERING AND THIN FILMS IST

Application Center for Plasma and Photonics

The field of life sciences makes incredibly high demands of all manner of surfaces. Fraunhofer IST's Application Center for Plasma and Photonics develops environmentally friendly, plasma-based processes with which even temperature-sensitive natural and polymer-based surfaces can be sterilized, activated or specifically coated with functional layers. Further core competencies include the development of application-specific plasma sources and combining processes with laser technology.

Our specialist areas:

- Atmospheric pressure plasma-based processes and equipment
- Dermatological therapeutic application
- Seed treatment and pest control
- Surface metallization and functionalization

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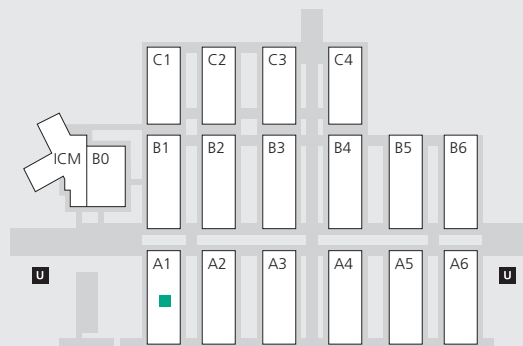
FRAUNHOFER INSTITUTE FOR SILICON TECHNOLOGY ISIT

Point-of-care diagnostics, micro-chromatography

Fraunhofer ISIT develops silicon chip-based microfluidic analysis systems for the separation and detection of chemical and biological molecules. These portable systems are designed to be robust, user-friendly and enable tests to be carried out anywhere quickly and accurately. They are particularly designed for use in point-of-care diagnostics and on-site food and environmental analytics.

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FRAUNHOFER-GESELLSCHAFT

Fraunhofer lighthouse project “Cell-free bioproduction”

In-vitro protein synthesis techniques are an alternative way to produce high grade biomolecules. Despite the advantages it offers (e.g. use of artificial amino acids, rapid synthesis), this technology has not been used for industrial scale production until now. As part of the Cell-free bioproduction lighthouse project, eight Fraunhofer Institutes are tackling the interdisciplinary challenge of developing reactor systems for resource-saving protein synthesis including methods to supply the process with energy.

- Upscaling and automation
- Resource-saving via active control
- Developing rapid screening methods
- Broad protein spectrum

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