Fraunhofer ISC

Fraunhofer Institute for Silicate Research ISC

Automation. Digitalization. Optimization.

AI driven LAB 4.0 -

robotic material development platforms to accelerate your material solutions (MAPs)

PROCESS AUTOMATION

Interface between automation and data management

The development of modern technologies increasingly relies on interdisciplinary approaches. As the demands for new products, materials, and manufacturing processes grow more complex, a wide range of factors must be considered - from raw materials, CO_2 footprint, resource conservation, and recyclability to biocompatibility, regulatory compliance, and documentation. Digitalization, artificial intelligence, and intelligent interfaces play a crucial role in managing this complexity. Through these advanced tools and methodologies, new products are created using innovative processes.

Our offer

With interdisciplinary expertise in applied materials research, process and plant engineering, data science, and life sciences, we deliver integrated, tailored solutions.
The team is proficient in the analog world of materials science and engineering, while also seamlessly integrating interfaces to the digital realm. This is further enhanced by consulting services in digital technologies and production systems, as well as support in data analysis and evaluation. We are also developing robotic laboratory and synthesis units by merging materials science, automation, and data management - ushering in the era of LAB 4.0.

INTERFACES

LAB 4.0 for material science

EVALUATION + INTERPRETATION

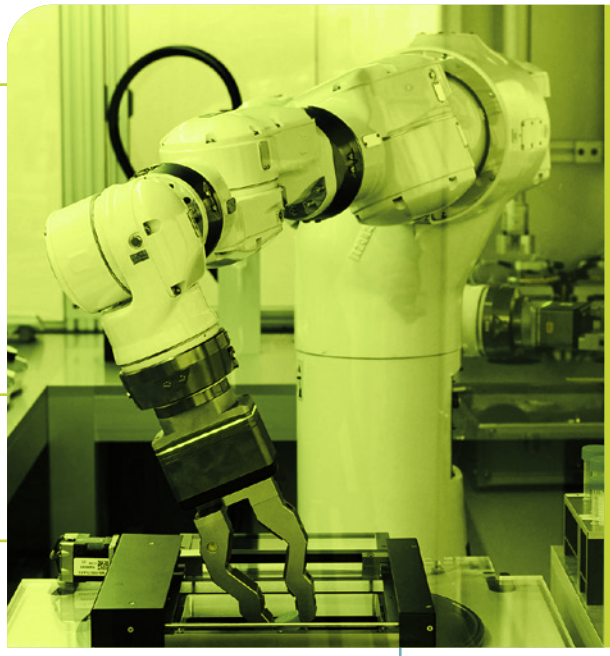
Efficiency despite complexity

Knowledge-based development of new products, processes, and applications is made possible through digitized workflows and artificial intelligence tools. This approach enables a significantly more efficient journey from initial concept to market-ready technology, even when requirements are highly complex and the materials involved are new and innovative.

Accelerate your innovations with Lab 4.0. From AI-driven workflows and robotic labs to automated analysis, we deliver integrated solutions that turn complex challenges into market-ready products and processes.

ELECTRONIC LAB NOTEBOOK

MATERIALS OPTIMIZATION



Robotic processes, automation, equipment and process optimization create potential for cost efficiency and process safety in the area of material development and production.

AUTOMATION

Intelligent knowledge and data management software, digital lab notebooks, and AI-compatible measurement protocols serve as valuable interfaces to support data acquisition, analysis, evaluation and integration.

DIGITALIZATION

Digital tools are valuable as they support humans, but they cannot replace professional expertise. Practical knowledge remains essential especially in analytics - for the final evaluation and selection of solutions for new products and processes.

OPTIMIZATION

AUTOMATION

DIGITALIZATION

OPTIMIZATION

Contact

Fraunhofer Institute for Silicate Research ISC
Neunerplatz 2
97082 Würzburg
www.isc.fraunhofer.de

Dr. Simon Stier
Head of Digital Transformation
Phone +49 931 4100-661
simon.stier@isc.fraunhofer.de

Dr. Andreas Diegeler
Head of Center of Device Development
Phone +49 9342 9221-702
andreas.diegeler@isc.fraunhofer.de

Dipl. Ing. Thomas Schwarz
Head of Lab Automatization and Bioreactor Technologies
Phone +49 931 4100-313
thomas.schwarz@isc.fraunhofer.de