

# Facilitating process scaling

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Fraunhofer Chemistry Alliance



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The Fraunhofer Chemistry Alliance is a reliable partner for the chemical industry in technology development and technology scaling on the way toward the commercialization of products and processes.

As an application-oriented research and development partner, we offer exclusive cooperation opportunities specifically designed to increase technology maturity and facilitate the scale-up of chemical processes. For this purpose, not only state-of-the-art infrastructure and equipment are available but also complementary competences ranging from technical realization and plant operation to issues of process safety, regulatory affairs, sustainability and economic efficiency.

Our cooperation opportunities also serve to reduce development risks by enabling Fraunhofer to take on larger research tasks up to and including the realization of prototypes.

## Competence areas of the Fraunhofer Chemistry Alliance

The Fraunhofer Chemistry Alliance pools the central expertise of its member institutes in the fields of chemistry, chemical engineering and biotechnology, as well as automation, digitization and regulatory issues. Complementary collaboration is achieved with expertise at the molecular, process engineering and data levels.

All alliance institutes have many years of experience in R&D with the chemical industry, and have very good industry knowledge and networks.



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We support our industrial customers in realizing and scaling their chemical processes with a wide range of service offers in the following areas:

### Process design and sizing

- Miniplant processes and facilities
- Catalyst test benches
- Process analytical technologies & process diagnostics
- Transfer from batch to continuous processes
- Micro process engineering
- Reactor and module design, construction and manufacturing
- Modular process concepts
- Safety engineering designs

### Technical plants

- Pilot plants (e.g. power-to-X processes, biorefineries, production-on-demand processes, chemical recycling processes)
- Chemical and biotechnological processes up to 10 m<sup>3</sup> reactor volume
- Polymer syntheses up to the ton range
- Continuous production processes
- Chemical containers
- Application plants

### Industrial process demonstration

- Operation and simulation
- Provision of sample material up to ton scale
- Provision of process data
- Transformation of the raw material base

### Optimization and digitization

- Modeling, simulation and optimization on different scales
- Process control and optimization, process automation
- (Interactive) decision support
- Digital twins

### Safety and regulations

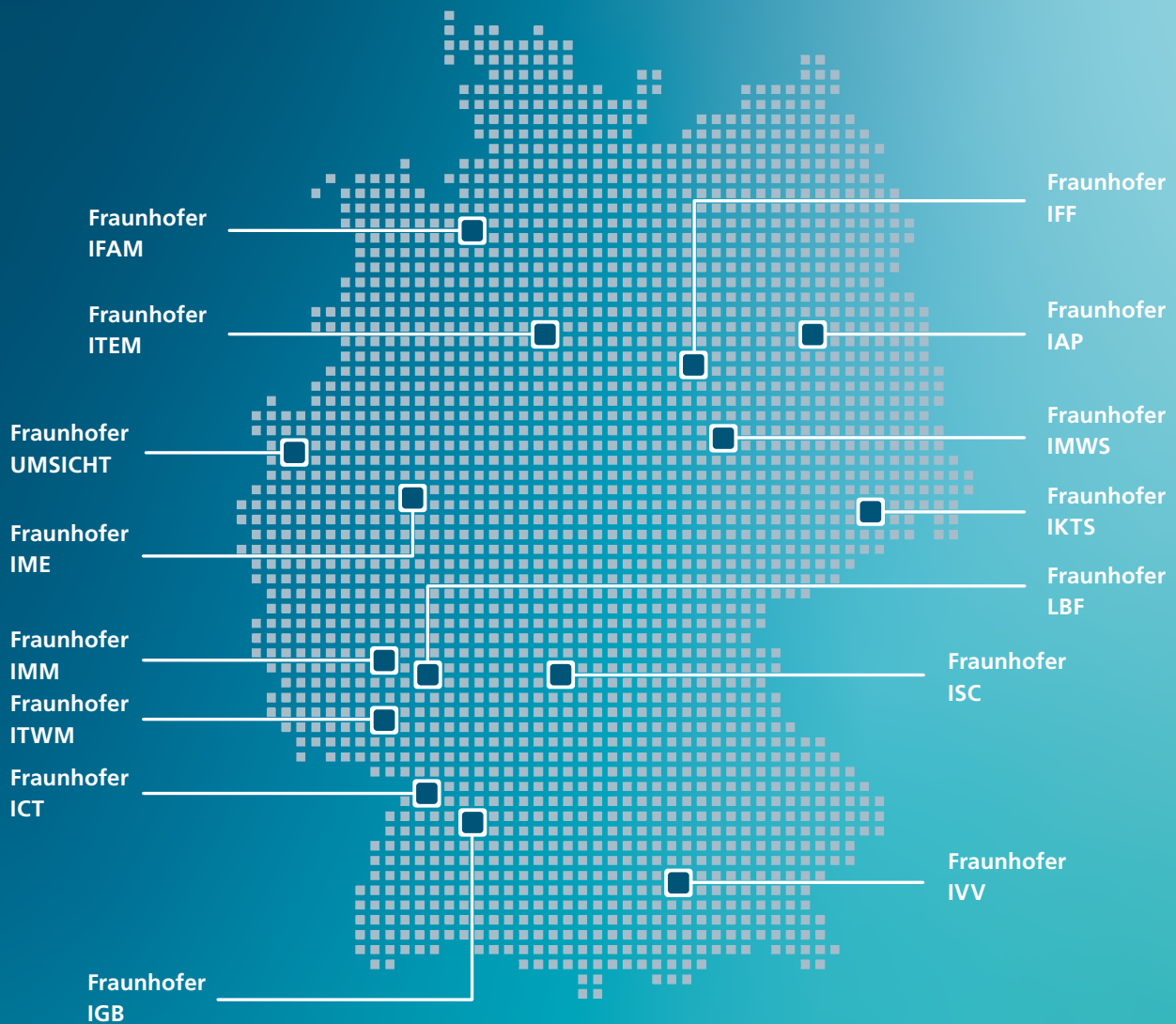
- Safety concepts and support during approval and licensing procedures
- Environmental behavior studies
- Thermal safety and explosion protection
- Regulatory GLP studies (e.g. REACH)

### Economy and ecology

- Techno-economic process evaluation, system analyses
- Life cycle assessment
- Business models



These 15 Fraunhofer institutes cooperate in the Fraunhofer Chemistry Alliance:



<b>IAP</b>	Applied Polymer Research	<b>IMM</b>	Microengineering and Microsystems
<b>IKTS</b>	Ceramic Technologies and Systems	<b>IMWS</b>	Microstructure of Materials and Systems
<b>ICT</b>	Chemical Technology	<b>IME</b>	Molecular Biology and Applied Ecology
<b>UMSICHT</b>	Environmental, Safety and Energy Technology	<b>IVV</b>	Process Engineering and Packaging
<b>IFF</b>	Factory Operation and Automation	<b>ISC</b>	Silicate Research
<b>ITWM</b>	Industrial Mathematics	<b>LBF</b>	Structural Durability and System Reliability
<b>IGB</b>	Interfacial Engineering and Biotechnology	<b>ITEM</b>	Toxicology and Experimental Medicine
<b>IFAM</b>	Manufacturing Technology and Advanced Materials		

## Fraunhofer Chemistry Alliance

Scan the QR code and find out more about our competences and cooperation offers.



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