

COOPERATION IN GROUPS, ALLIANCES AND NETWORKS

Scientists at Fraunhofer IKTS are active in numerous thematically oriented networks, alliances and groups. Therefore, our customers benefit from having a coordinated range of joint services available to them.

Membership in Fraunhofer Groups, Alliances, Networks and Demonstration Center

AMA Association for Sensors and Measurement

American Ceramic Society (ACerS)

Association Competence Center for Aerospace and Space Technology Saxony/Thuringia (LRT)

Association for Manufacturing Technology and Development (GFE)

Association of Electrochemical Research Institutes (AGEF)

Association of German Engineers (VDI)

Association of the Thuringian Economy, Committee of Research and Innovation

Association of Thermal Spraying (GTS)

Carbon Composites (CCeV)

Ceramics Meeting Point Dresden

Competence Center for Nano Evaluation nanoeva®

Competence Network on Optical Technologies (Optonet)

Cool Silicon

DECHEMA – Society for Chemical Engineering and Biotechnology

Deutsche Glastechnische Gesellschaft (DGG)

DIN – German Institute for Standardization

DKG/DGM Community Committee

DRESDEN-concept

Dresden Fraunhofer Cluster Nanoanalysis

Dresdner Gesprächskreis der Wirtschaft und der Wissenschaft

Energy Saxony

Ernst Abbe University of Applied Sciences Jena, university council

European Powder Metallurgy Association (EPMA)

European Rail Innovation Center

European Research Association for Sheet Metal Working (EFB)

Expert Group on Ceramic Injection Molding (Working Group in the German Ceramic Society)

Expert Group on High-Temperature Sensing Technology in the German Society for Materials Science

Fraunhofer Adaptronics Alliance

Fraunhofer Additive Manufacturing Alliance

Fraunhofer AdvanCer Alliance

Fraunhofer Battery Alliance

Fraunhofer Cluster 3D Integration

Fraunhofer Energy Alliance

Fraunhofer Group for Materials and Components – MATERIALS

Fraunhofer Group for Microelectronics

Fraunhofer Lightweight Design Alliance

Fraunhofer Nanotechnology Alliance	Materials Research Network Dresden (MFD)
Fraunhofer Numerical Simulation of Products and Processes Alliance	medways
Fraunhofer Sensor Network	Meeting of Refractory Experts Freiberg (MORE)
Fraunhofer Vision Alliance	Micro-Nanotechnology Thuringia (MNT)
Fraunhofer Water Systems Alliance (SysWasser)	NanoMat – Supraregional Network for Materials Used in Nanotechnology
German Acoustical Society (DEGA)	Nanotechnology Center of Excellence for “Ultrathin Functional Layers”
German Association for Small and Medium-sized Businesses (BVMW)	ProcessNet – an Initiative of DECHEMA and VDI-GVC
German Biogas Association	Research Association for Diesel Emission Control Technologies (FAD)
German Ceramic Society (DKG)	Research Association for Measurement Technology, Sensors and Medical Technology Dresden (fms)
German Electroplating and Surface Treatment Association (DGO)	Research Association on Welding and Allied Processes of the German Welding Society (DVS)
German Energy Storage Association (BVES)	Silicon Saxony
German Engineering Association (VDMA)	smart ³
German Society for Materials Research (DGM)	Society for Corrosion Protection (GfKORR)
German Society for Non-Destructive Testing (DGZfP)	Wasserwirtschaftliches Energiezentrum Dresden
German Thermoelectric Society	WindEnergy Network Rostock
Hydrogen Power Storage & Solutions East Germany	
International Energy Agency (IEA) Implementing Agreement on Advanced Fuel Cells	
International Zeolite Association	
KMM-VIN (European Virtual Institute on Knowledge-based Multifunctional Materials AISBL)	

THE FRAUNHOFER GROUP FOR MATERIALS AND COMPONENTS – MATERIALS

Fraunhofer research in the field of materials science and engineering covers the entire value chain from the development of new materials and the improvement of existing ones to manufacturing technology on a semi-industrial scale, the characterization of materials' properties and the assessment of their performance. This work extends to the components produced from the materials and their performance in systems.

In addition to experimental tests in laboratories and pilot plants, numerical simulation and modeling techniques are applied in all these areas and in all dimensions, on molecular scale as well as on component scale and with respect to processes. The Fraunhofer Group for Materials and Components – MATERIALS encompasses the entire field of metallic, inorganic-nonmetallic, polymer and sustainable materials, as well as semiconductor materials.

The Group concentrates its expertise mainly in the Energy and Environment, Mobility, Health, Machinery and Plant Engineering, Construction and Living, Microsystems Technology, and Safety business sectors. System innovations are achieved by means of tailor-made material and component developments and customer-specific performance assessment. With strategic forecasts the group supports the development of future materials and technologies.

Key objectives of the group are

- To increase safety and comfort and to reduce the consumption of resources in transport, mechanical engineering, plant construction and building industry
- To raise the efficiency of systems for generating, converting, storing energy and distributing
- To improve the biocompatibility and functioning of materials used in medical engineering and biotechnology
- To increase the integration density and improve the utility properties of components in microelectronics and microsystems technology

- To improve the use of raw materials and the quality of the products made from them
- Recycling concepts

The group comprises the Fraunhofer Institutes for

- Applied Polymer Research IAP
- Building Physics IBP
- Structural Durability and System Reliability LBF
- Chemical Technology ICT
- Manufacturing Technology and Advanced Materials IFAM
- Wood Research, Wilhelm-Klauditz-Institut WKI
- Ceramic Technologies and Systems IKTS
- High-Speed Dynamics, Ernst-Mach-Institut EMI
- Silicate Research ISC
- Solar Energy Systems ISE
- Systems and Innovation Research ISI
- Mechanics of Materials IWM
- Non-Destructive Testing IZFP
- Wind Energy and Energy System Technology IWES

Permanent guests of the Group are the Institutes for:

- Industrial Mathematics ITWM
- Interfacial Engineering and Biotechnology IGB
- Integrated Circuits IIS

Chairman of the group

Prof. Dr.-Ing. Peter Elsner

Fraunhofer Institute for Chemical Technology ICT

www.materials.fraunhofer.de



FRAUNHOFER ADVANCER ALLIANCE

Systems development with high-performance ceramics

The usage of high-performance ceramics allows for new applications in energy engineering, mechanical and plant engineering, and medical technology. Well-known examples are highly efficient tools and coatings, new material and manufacturing technologies for medical-technical products as well as creative solutions for energy and resource saving industrial processes. This innovative area has become an established field of expertise of the Fraunhofer-Gesellschaft.

Four Fraunhofer Institutes (IKTS, IPK, ISC/HTL and IWM) have joined together to form the Fraunhofer AdvanCer Alliance. It is the aim of AdvanCer to develop individual systems solutions with advanced ceramics for industry. The research activities of the Fraunhofer Alliance extend along the entire value-added chain from modeling and simulation through application-oriented materials development, production and machining of ceramic parts to component characterization, evaluation and non-destructive testing under application conditions. Development work is conducted and supported by modeling and simulation methods.

Furthermore, AdvanCer has established a comprehensive range of presentation, training and consultancy services to support small and medium companies in solving complex tasks ranging from prototype development to technology transfer. Since 2005, the Fraunhofer AdvanCer Alliance has been offering training courses for technicians and engineers. The three parts being offered follow one after another, but can also be taken as single courses.

Fields of cooperation

- Materials development for structural and functional ceramics, fiber-reinforced ceramics, cermets and ceramic composites
- Component design and development of prototypes
- Systems integration and verification of batch-production capabilities
- Development of powder, fiber and coating technologies
- Materials, component and process simulation
- Materials and component testing
- Defect analysis, failure analysis, quality management
- Analysis of energy demand for thermal processes, development of temperature cycles with improved energy efficiency
- Increase of efficiency using ceramic components

Services offered

- Development, testing and evaluation of materials
- Prototype and small series production
- Method and technology development, technology transfer
- Process analysis and design
- Consulting, feasibility studies, training programs

Spokesperson of the Alliance

Dr. Michael Zins
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Fraunhofer Institute for Ceramic Technologies and Systems IKTS
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1 Tests on NC free-form grinding of Si_3N_4 micro gas turbine rotors (source: Fraunhofer IPK).



GROUPS, ALLIANCES, NETWORKS

CERAMICS MEETING POINT – CERAMIC APPLICATIONS

Ceramics Meeting Point is an integral part of the public relations activities of Fraunhofer IKTS. The industry partners use the fast access to the research infrastructure of the Fraunhofer-Gesellschaft. The cooperation of Fraunhofer IKTS, the Goeller Verlag and its currently 26 members forms the basis for new project ideas. Prospectively, new issues in the area of materials diagnostics will be offered here. The opportunity to see the latest research topics in one room and to get in contact with possible suppliers is a unique capability of Fraunhofer IKTS. The members of the Fraunhofer AdvanCer Alliance also benefit from this infrastructure. The meeting point is a suitable platform to acquire, for example, industry partners for research-accompanying committees of AiF projects.

The newly developed magazine “Ceramic Applications” is a key element to inform potential users of advanced ceramics. Joint trade fair activities regarding the Hannover Messe and the Ceramics Expo form strategic marketing alliances.

In the workshops and training courses of the Fraunhofer AdvanCer Alliance, Ceramics Meeting Point is used to present the state of the art as desired by the participants. Thus, a project forum for small and medium-sized companies has developed, facilitating contacts to project initiators and research institutes. By visiting the Ceramics Meeting Point within the framework of numerous events taking place at Fraunhofer IKTS, once again more than 1650 visitors informed about ceramic product innovations and manufacturers in 2014.

One highlight in 2015 will certainly be the “Technical Ceramics Day” at the Ceramtec in Munich, Germany. As part of a joint presentation, the Technical Ceramics with approx. 30 partners are displayed on more than 400 m². The AdvanCer Alliance is responsible for the scientific organization of the lecture program.

Members of the Ceramics Meeting Point

TREFFPUNKT KERAMIK CERAMIC APPLICATIONS



1 Hannover Messe 2015: presentation of the Ceramics Meeting Point at the Ceramic Applications Booth.