FRAUNHOFER INSTITUTE FOR MANUFACTURING TECHNOLOGY AND ADVANCED MATERIALS IFAM



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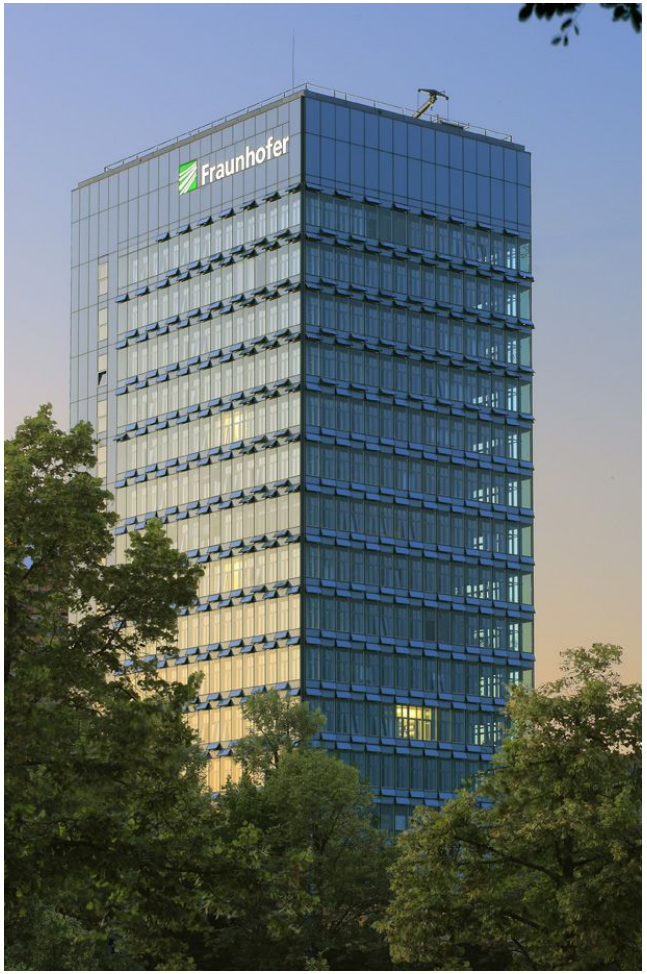
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The Fraunhofer-Gesellschaft



- **March 26, 1949:** The Fraunhofer-Gesellschaft is founded in Munich, Germany
- **1952:** Fraunhofer-Gesellschaft is recognized as 3rd pillar in the German research community next to the Deutsche Forschungsgemeinschaft (DFG) and the Max-Planck-Gesellschaft (MPG)
- **2014:**
  - 67 Fraunhofer institutes / facilities
  - more than 23,000 employees, mainly with background in natural sciences and engineering
  - ca. 2.1 bn. € research budget (expected)

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Fraunhofer Division MATERIALS

MATERIALS RESEARCH ACROSS ENTIRE VALUE CHAINS

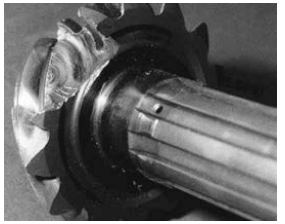
from developing new materials through quasi-industrial scale manufacturing technology to the characterization of properties and assessment of service behavior; covering components their functions, as well

material development



component and system reliability

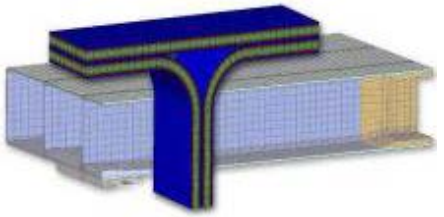




technology development



materials modeling and simulation



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The Fraunhofer IFAM



Fraunhofer Institute for Manufacturing Technology and Applied Materials Research

- established in 1968;
  part of FhG since 1974
- headquarter in Bremen
  - locations in Dresden, Stade, Oldenburg
- approx. 580 employees;
  research budget in 2013 ca. 46 Mio. €
- two divisions:
  - shaping and functional materials
  - adhesive bonding and surface technology
- close co-operation with the Universities of Bremen and Dresden

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Organizational Structure of Fraunhofer IFAM

Institute Directors

Prof. Dr.-Ing. Matthias Busse — Prof. Dr. rer. nat. Bernd Mayer

Institute Division Shaping and Functional Materials Prof. Dr.-Ing. Matthias Busse Prof. Dr.-Ing. Frank Petzoldt (dep.)		Institute Division Adhesive Bonding Technology and Surfaces Prof. Dr. Bernd Mayer Prof. Dr. Andreas Hartwig (dep.)	
Dresden Branch Prof. Dr.-Ing. Bernd Kieback	Bremen und Oldenburg	Bremen	Stade
Sintered and composite materials	Powder technology	Adhesive bonding technology	Automation and production technology
Cellular metallic materials	Casting technology and Component development	Adhesives and polymer chemistry	
Hydrogen technology	Functional structures	Material science and mech. engineering	
Energy and thermal management	Electrical energy storage	Applied surface and adhesion science	
	Electrical systems	Plasma technology and surfaces	
	Personnel training “Electromobility“	Paint and lacquer technology	
	Materialography and Analytics	Workforce qualification and technology transfer	

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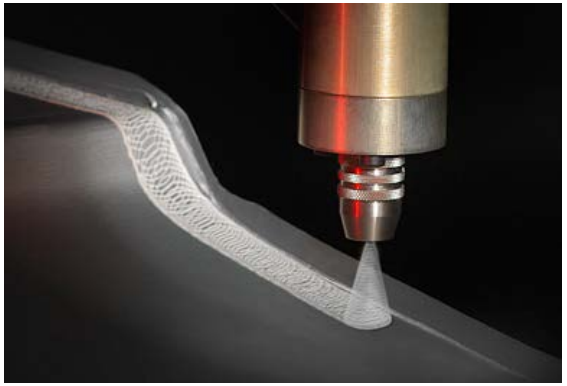
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Fraunhofer IFAM – Core Competencies

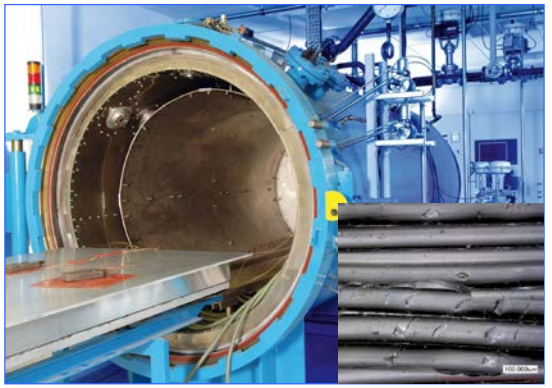
Surface Technology



Adhesive Bonding

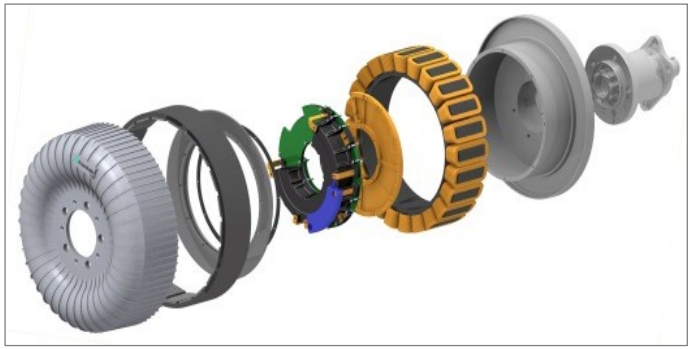


Fiber Reinforced Materials





Casting technology



Electrical Components and Systems

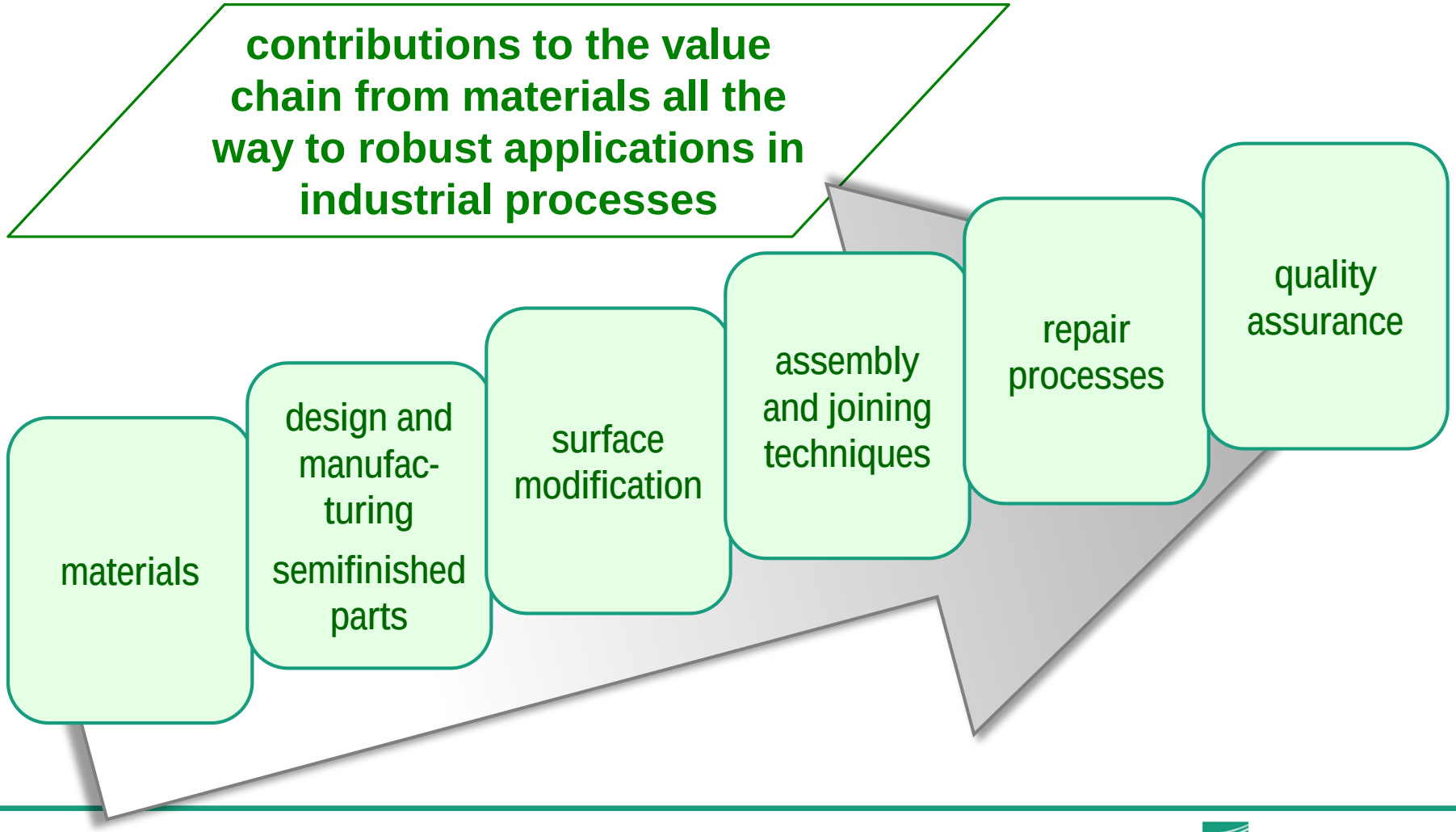


Powder Technology Sintering Processes

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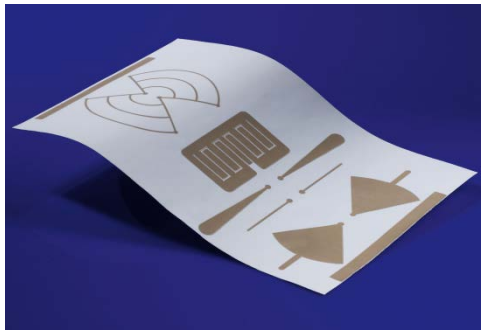
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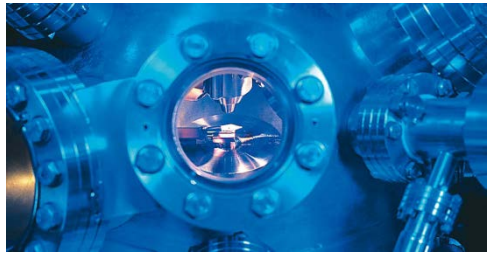
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Adhesive Bonding Technology and Surfaces







manufacturing technology and applied material science scoping

Adhesive Bonding, Surface Technology and Composite Materials …

development focus:

- materials
- manufacturing integration
- fast processes
- reliability and quality

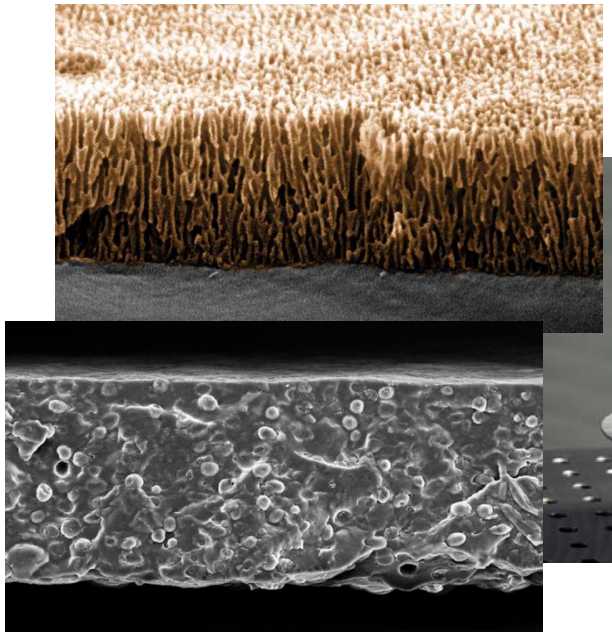
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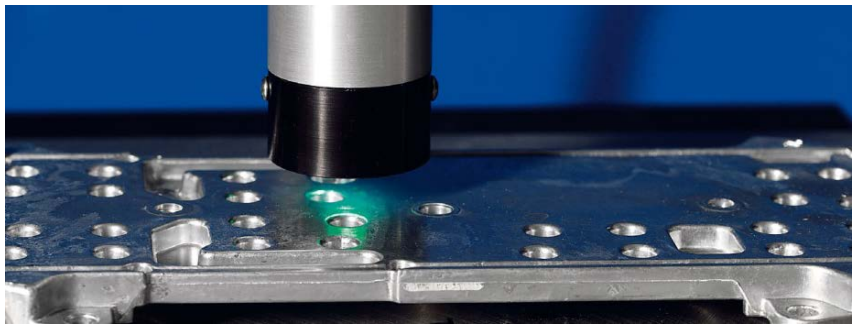
Surface Treatment

- **Process Engineering**
  - pilot-plant for plasma processes
  - paint application, drying
  - surface pretreatment
  - plasma processes and equipment

- **Material Screening / Qualification**
  - paint and coating accessories
  - raw material characterization
  - cleaning agents







- **Surface Analysis**
  - chemical, electrochemical and micro-structural analyses
  - optical / mechanical properties, wetting
  - production-integrated quality assurance
  - failure analysis

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Adhesive Bonding - Competencies

Material Development	Characterization	Structures	Application Processes	Quality Assurance
• adhesives, potting materials, coating materials • modification of polymer systems • biomimetic adhesives • adhesion promotion • aging protection	• thermo-analytics • chemical analysis (IR, chromatography) • describing material behavior • rheology • adhesion • aging of bonded structures	• measuring and calculation of manufacturing effects • modeling, simulation, dimensioning of adhesive bonds • hybrid structures • aging of bonded structures	• adhesive selection and qualification • surface treatment • dosing and mixing techniques • simulation of flow behavior • automation • tolerance adjusted manufacturing • potting	• Optical measuring technique • inline-analytics • Destructive and non-destructive testing and qualification • certification body of German EBA • workforce qualification

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