

Korea-EU Horizon Europe Researchers Networking Forum on Energy & Advanced Mobility

Dr. Christian Beinert

Head of Department

**Fraunhofer Institute
for Structural
Durability and System
Reliability LBF**

**Polymer Processing and
Component Design**

1. Short Introduction of your Organization

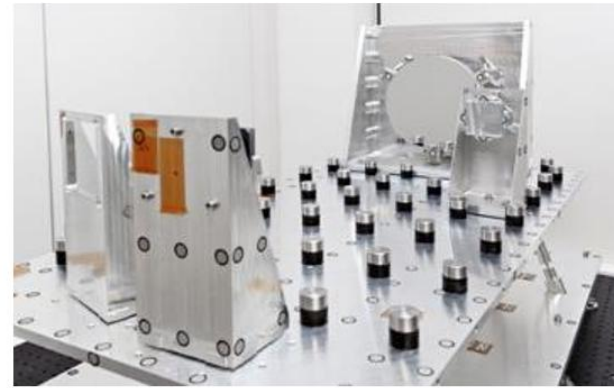
Facts and Figures 2024:

- Budget: €31m
- 330 Employees at LBF
- 86 Scientific publications
- 29 Academic degrees
- 25 Lectures
- 8 New Patents



Structural Durability

Structural Durability forms the basis of our research activities since the Fraunhofer LBF was founded.



Smart Structures

Since 2001, we have been providing innovative solutions from analyzing structural dynamics to optimizing the vibration behavior of components and structures.



Plastics

Since 2012, an integral part of our competencies is the realization of plastics applications from , additivation, analytics, processing and component design..

2. Expertise

Reliability and Safety along the value-chain

Reliability Design:

- Development of methods for the numerical and experimental design and assurance of the service life of materials, components and products
- Operational strength and system reliability evaluations considering combined multi-physical loads

Circular Economy:

- Development of high-performance polymers by additivation to define the properties of recycled material
- Development of bioadditives as substitutes for commercial systems
- Development of biopolymers from renewable raw materials
- Design of sustainable, recyclable lightweight solutions

Future Mobility:

- NVH design of electrically powered vehicles
- Multiphysical simulation and validation of energy storage and fuel cell systems
- Electric storage concepts, e.g., for bicycles, drones, and other modes of transportation





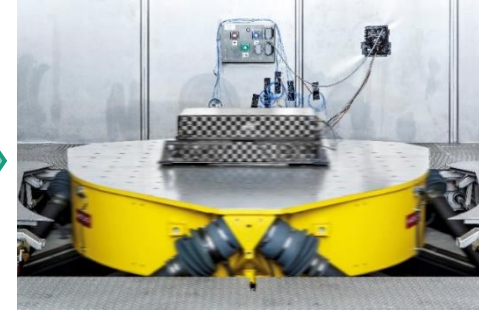
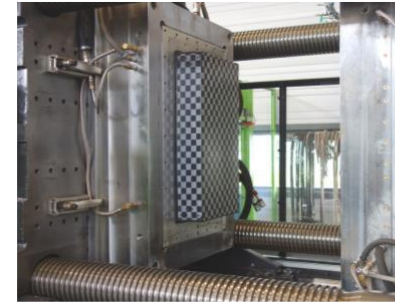
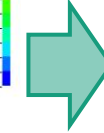
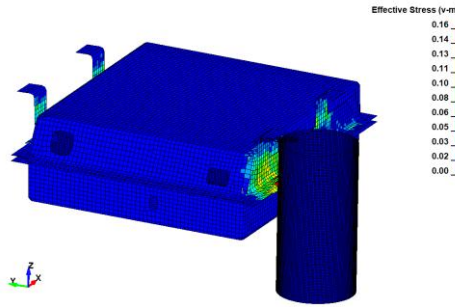
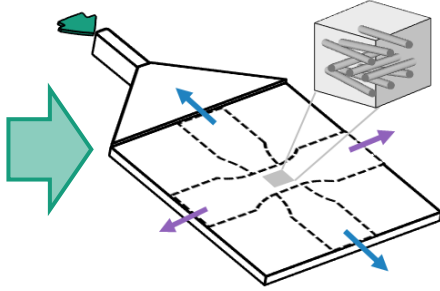
3. Your Project Idea

e.g. HORIZON-CL5-2026-10-D2-03:

Integrated Production and Product Development for Next-Generation Lithium-based Batteries for Mobility

- Scaling-up next generation lithium-based batteries to demonstrate scalable production and cell integration at module/pack level
- Upscaling component production technologies, including optimization of anode and cathode materials for next generation electrolytes
- Design and validate battery modules/packs with optimized Battery Management Systems (BMS) for regulatory compliance and specific application requirements.
- Comprehensive testing for performance, durability, and safety under realistic operational conditions, focusing on thermal management, mechanical stress, and electrical performance.
- Using functionalized thermoplastic-based materials (flame-retardant, recyclable, light-weight, ..)
- Combination of foam injection molding with overmoulding technology
- Design for recyclability
- Development of methods for accelerated service life tests under metaphysical loads on demonstrator level, Coupling field data, numerical data and test data to reduce the effort(Faster access to the market)
- Combined acceleration and vibration analysis in all directions (Testing under full electric load including cooling)
- Failure Mode and Effects Analysis (FMEA)

4. Profile You are Seeking and Why



Partners to complete the value chain

- Cell development and manufacturing
- Module design development
- Battery pack manufacturing
- Recycler
- Digitalization experts
- ...





5. Contact Details

Dr.-Ing. Christian Beinert

Head of Department Polymer Processing and Component Design
Fraunhofer Institute for Structural Durability and System Reliability LBF
Schlossgartenstr. 6
64289 Darmstadt, Germany
Phone: +49 6151 705-8735
Fax: +49 6151 705-8601
Christian.Beinert@lbf.fraunhofer.de

