

Profile

The research focus of product development toolmaking combines expertise of professors from the Faculty of Mechanical Engineering.

Symbiotic effects are formed through interdisciplinary priorities production and developmental based know-how supports the development process and allows examination of an object from different points of view.

The motivation of the research focus includes the approach: "From idea to product". A product is the result of activities and processes. Within the research focus this result can be a product and/or a complex tool.

Core competencies

Prof. Dr.-Ing. habil. Annett Dorner-Reisel conducts research e.g. in the field of tribology of carbon-based thin-film systems in biodiesel and heterogeneous fuel mixtures. The objective of the project is the systematic study of friction and wear behaviour of DLC coatings in various grades of diesel and gasoline with portions of biofuels and under different temperatures. Various wear test stands are used for this purpose.

Prof. Dr.-Ing. Thomas Seul, whose appointment area is manufacturing technology and tool design, supports the research focus through advanced product development skills in the field of medical technology and related processes and procedures in tool making.

Contact

Research Focus: Product Development Toolmaking

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The use of simulation and design programs is a core competence of Prof. Dr.-Ing. Hendrike Raßbach.

The application is used, among other things, for:

- Design, simulation, animation as part of the Digital Prototyping
- Forming simulation of anisotropic materials
- Static and dynamic 3D deformation measurement (ARAMIS system)
- Modular qualification program "Structural Mechanics for designers and product developers"

The core competencies of Prof. Dr.-Ing. Harald Vogel are used in the field of machining and thermal ablation. Associated with this, for example, is the assessment of the functional properties of complex cutting tools by means of cutting force and acoustic emission analysis during machining. Based on these analysis valid statements can be gained about wear behaviour, concentricity (unbalanced) or tool breakage.

Abrasive methods include electrical discharge cutting, die-sinking EDM and erosive drilling. The goal of the work is solutions for producing filigree structures with high aspect ratio. This is achieved through targeted adaptation of the processing parameters and an optimised machining strategy.

In addition to contributed core competencies of the individual business areas, the performance range of the research also in particular includes the resultant cross-cutting issues.

Staff and facilities

The research focus of product development/tool making consists of the four participating professors and their associated laboratories.

Please refer to the information on individual laboratories for details on the equipment:

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Selected reference projects

Tool calculation/optimization

Computer simulations based on the finite element method for determining the insulation displacement contact performance, taking into account the resulting dynamic forces.

Cooperation project with the GFE - Society for Research and Development - Schmalkalden.

Projects in the field of service life determination for coated tools, for example, high performance cutting, forming tools.

Accompanying a tool development and support of FEM simulation and prototyping.

Project objective: Producing electronic components in which metallic conductor tracks are applied to injection moulded plastic carrier.

- MID (Moulded Interconnect Devices) research project which was carried out with the affiliated partner Thüringische Weidmüller GmbH
- Laser structured and metallized plastic component, which has been assembled using SMD
- Operational MID demonstrator