

# Technical University of Munich

## Research Centre for Gears and Transmission Systems

### About this organisation

#### Machine translation

This organisation has been machine-translated based on data provided in German.

The Research Centre for Gears and Transmission Systems (FZG) is an internationally renowned research centre for gears and transmissions at the Technical University of Munich (TUM). The research activities focus on the development of methods and reliable statements on the service life, efficiency and vibration behaviour of transmission elements such as gears, synchronisers, couplings, rolling bearings and transmission systems.

As part of various research activities at the FZG, lightweight construction solutions are being researched from model to system level. For example, alternative gear materials in the form of high-performance plastic gears or composite gears as well as tribologically more resilient tooth contacts through coatings or higher-strength material properties for plastic gears are being investigated at component level. In addition, the lightweight construction potential of additive manufacturing processes is being researched on these gears. The findings from the basic research are improving gear applications with higher power density and thus enabling lightweight system design. By investigating self-lubricated machine elements, the FZG is pursuing a promising new approach to operating lightweight transmission systems without external lubricant and the additional lubricant supply and sealing systems required for this.

Boltzmannstraße 15  
85748 Garching b. München  
Bavaria  
Germany  
[www.mec.ed.tum.de/fzg/startseite/](http://www.mec.ed.tum.de/fzg/startseite/)



#### Organisation type

University or higher education institution

#### Sectors



#### Employees

50 up to 249

#### Turnover

n/a

#### Funding

# Technical University of Munich

## Research Centre for Gears and Transmission Systems

### About this organisation



**Main areas covered** Load capacity, Operational stability, Tribology, Efficiency, Vibration behaviour

**Infrastructure** Model and component test benches, System test benches, Measuring/material/lubricant laboratory, Calculation programmes, Workshop

#### Certifications

**Keywords** Gear wheels, Rolling bearings, Gearbox, Synchronisations and clutches, Drive technology

#### Memberships

## Overview of lightweighting expertise

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	Research	Development	Manufacturing & Supply
<b>Offer</b>			
<b>Products</b> Parts and components, Software & databases	✓	✓	
<b>Services &amp; consulting</b> Training, Consulting, Testing and trials, Engineering, Standardisation, Prototyping, Validation, Simulation, Technology transfer	✓	✓	✓
<b>Field of technology</b>			
<b>Design &amp; layout</b> Lightweight manufacturing, Lightweight design, Hybrid structures, Lightweight construction concepts, Lightweight material construction	✓	✓	
<b>Functional integration</b> Media conductivity, Sensor technology, Material functionalisation	✓	✓	
<b>Measuring and testing technology</b> Component and part analysis, Visual analysis (e.g. microscopy, metallography), System analysis, Materials analysis, Destructive analysis, Non-destructive analysis	✓	✓	
<b>Modelling and simulation</b> Loads & stress, Multiphysics simulation, Optimisation, Structural mechanics, Materials	✓	✓	
<i>Plant construction &amp; automation</i>			
<i>Recycling technologies</i>			

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### Overview of lightweighting expertise

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Manufacturing  
Research   Development   & Supply

#### Manufacturing process

##### Additive manufacturing

3D printing, Selective laser melting (SLM, LPBF, ...), Selective laser sintering (SLS), Stereolithography



##### Coating (surface engineering)

Painting, Plasma process, Sputtering



Fibre composite technology

Forming

Joining

##### Material property alteration

Mechanical treatment, Thermochemical treatment, Heat treatment



Primary forming

Processing and separating

Textile technology

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Manufacturing  
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#### Material

*Biogenic materials*

*Cellular materials (foam materials)*

#### Composites

Glass-fiber reinforced plastics (GFRP), Carbon-fiber reinforced plastics (CFRP)



*Fibres*

*Functional materials*

#### Metals

Aluminium, Intermetallic alloys, Steel



#### Plastics

Thermoplastics



*Structural ceramics*

*(Technical) textiles*

### Contacts

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*Research Centre for Gears and Transmission Systems*

**Contacts**

Mr Nicolai Sprogies, M.Sc.

*scient. employee*

[nicolai.sprogies@tum.de](mailto:nicolai.sprogies@tum.de)

Mr Martin Weber, M.Sc.

*scient. employee*

[martin.mw.weber@tum.de](mailto:martin.mw.weber@tum.de)

Mr Prof. Dr.-Ing. Karsten Stahl

*Institute Director*

[karsten.stahl@tum.de](mailto:karsten.stahl@tum.de)

Mr Yves Barth

*scient. employee*

[yves.bARTH@tum.de](mailto:yves.bARTH@tum.de)