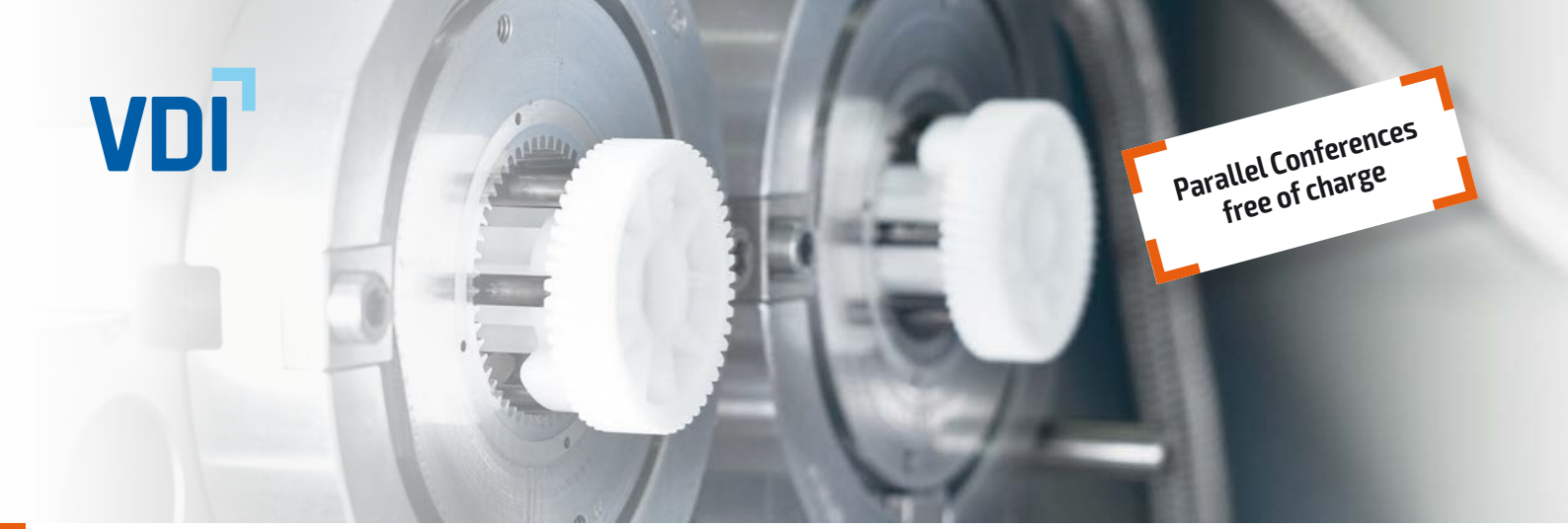

Source: © HORST SCHOLZ GmbH & Co. KG

5th International Conference on High Performance Plastic Gears 2023

Key topics discussed:

- **Carbon footprint assessment of sustainable plastic materials**
- **Influence of manufacturing on gear quality and load capacity**
- **Recent calculation methods for load capacity and excitation behavior**
- **Recent test methods of plastic gears**
- **Optimizations of plastic gears**

Presidency:

Prof. Dr.-Ing. Karsten Stahl, Full Professor, Institute of Machine Elements, Director, Gear Research Center (FZG), TUM School of Engineering and Design, Technical University of Munich, Garching, Germany

+ Parallel events

International Conference on Gears 2023

International Conference on Gear Production 2023

+ Exhibition

With experts from:

Envalior – Imagine the Future · EVONIK – Leading Beyond Chemistry · Fraunhofer ICT · Fraunhofer IGCV · FZG · IMS GEAR · U.PORTO FEUP Faculdade de Engenharia Universidade do Porto · IKT Institute of Polymer Technology · KISSsoft A Gleason Company · kuraray · next|gear imk · RPTU · Ruhr Universität Bochum RUB · sabic · SOLVAY Progress beyond · TUM · Univerza v Ljubljani Fakulteta za strojništvo · victrex · Weißer + Gebhardt GmbH

Event organized by VDI Wissensforum GmbH
www.vdiconference.com/02TA409023
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#vdi_gears

September 13 - 15, 2023, Garching/Munich, Germany

1st Conference day
Wednesday, September 13th, 2023

08:15 Registration

Plenary lectures

Every participant gets a voice – you will be involved via digital polls during the speeches

09:30 Joint welcome and opening of the conferences
- International Conference on Gears 2023
- International Conference on High Performance Plastic Gears 2023
- International Conference on Gear Production 2023

Prof. Dr.-Ing. Karsten Stahl, Full Professor, Institute of Machine Elements, Director, Gear Research Center (FZG), TUM School of Engineering and Design, Technical University of Munich, Garching, Germany

09:55 Welcome address by

Prof. Dr. sc. tech. Gerhard Kramer, Senior Vice President Research and Innovation, TUM School of Engineering and Design, Technical University of Munich, Garching, Germany

Prof. Dr.-Ing. Birgit Vogel-Heuser, Vice Dean Research and Innovation TUM School of Engineering and Design, Chair of Automation and Information Systems, Technical University of Munich, Garching, Germany

10:05 Welcome address by

Dr.-Ing. Burkhard Pinnekamp, Head of Central Technology, RENK GmbH, Augsburg; President, Research Association for Drive Technology (FVA), Frankfurt, Germany

10:15 **Keynote session:**
Re-X: Recycle | Reuse | Reduce

Moderation: Prof. Dr.-Ing. Karsten Stahl, Full Professor, Institute of Machine Elements, Director, Gear Research Center (FZG), TUM School of Engineering and Design, Technical University of Munich, Garching, Germany

From why to how: It is time for sustainability to move from the executive agenda into the real world
- Determine emission baselines for product portfolio
- Prioritize levers to decrease emissions
- Achieve change through product design and business model adaptation

Dominik Leisinger, EMBA, Partner & Europe Lead Product Excellence (PERLab), A.T. Kearney (International) AG, Zurich, Switzerland

The need for global standards to define CO_2 footprint in product specifications
- High performance and low emissions is no conflict for engineering steels
- Maximum CO_2 and recycled content as properties in the steel product specifications
- Global initiatives vs sustainability demands on the product

Erik Claesson, M. Sc., Director, Automotive Segment & Group Business Intelligence, Ovako AB, Hofors, Sweden

Refurbishing tracked vehicle transmissions
- Extended lifetime
- Upgrade and Re-use
- Increase share of re-used parts

Dr.-Ing. Burkhard Pinnekamp, Head of Central Technology, Sebastian Schießler, M. Eng., Head of Repair, Vehicle Mobility Solutions, RENK GmbH, Augsburg, Germany

Increasing air travel and the challenges to reduce emissions
- Future demand in air travel
- Emissions of air travel
- New engine architecture to reduce emission for medium and long range flights

Dr.-Ing. David Krüger, Design Engineer, R&T Project Manager, Transmissions, Rolls-Royce Deutschland Ltd & Co KG, Blankenfelde-Mahlow, Germany

Efficiency-improvement with low-loss-gears by two different applications
- Low-loss-gears for a Wolfrom-transmission, reduced gear-mesh losses
- Wolfrom-transmission without carrier, no losses in the radial bearings for the planets
- Low-loss-gears for a normal planetary transmission (minus-type), efficiency-improvement in a special application

Prof. i.R. Dr.-Ing. Dr. h.c. Bernd-Robert Höhn, TUM emeritus of excellence, Michael Geitner, M. Sc., Research Associate, Institute of Machine Elements, Gear Research Center (FZG), TUM School of Engineering and Design, Technical University of Munich, Garching, Germany

12:00 **Time for working lunch** – meet & greet in the exhibition area, poster presentation area and GearArena

Opening of
5th International Conference on High Performance Plastic Gears 2023

Sustainability

Moderation: Prof. Dr.-Ing. Karsten Stahl, Full Professor, Institute of Machine Elements, Director, Gear Research Center (FZG), TUM School of Engineering and Design, Technical University of Munich, Garching, Germany

13:30 **Recycling of carbon fiber reinforced plastics – state of the art and challenges**
- Fiber matrix separation (pyrolysis and alternative processes)
- Process chains from recovered fibers to 2nd gen applications
- Aavailability of data for simulations

Dipl.-Ing. Jakob Woelling, Head of department "sustainable composites", Fraunhofer Institute for Casting, Composites and Processing Technologies (IGCV), Augsburg, Germany

14:00 **Advanced biopolymer compounds for technical applications**
- Overview of biopolymers and their properties
- Polylactide and opportunities of polylactide modification
- Examples of applications for polylactide compounds

Dr.-Ing. Kevin Moser, Group Leader, Sebastian Körber, M. Sc., Research Assosiate, Polymer Engineering, Fraunhofer Institut für Chemische Technologie ICT, Pfinztal, Germany

14:30 **Can additive manufacturing contribute to the green deal?**
- General overview of additive technologies
- Deep dive into laser-based powder bed fusion of plastics
- Sustainability – Is Additive Manufacturing sustainable?

Prof. Dr.-Ing. Katrin Wudy, Professorship of Laser-based Additive Manufacturing, TUM School of Engineering and Design, Technical University of Munich, Garching, Germany

15:00 **Coffee break** – meet & greet in the exhibition area, poster presentation area and GearArena

Tooth root strength

Moderation: Dr.-Ing. Andreas Langheinrich, Development Drive Technology, Horst Scholz GmbH & Co. KG, Kronach, Germany

16:00 **Prediction of tooth root fatigue failure of polymer gears for dry and oil lubricated contact and its comparison to experimentally obtained results**
- Analysis of tooth root fatigue failure, including stress differences and root crack growth
- Prediction of tooth root fatigue failure using multiaxial energy calculations
- Influence of different conditions, e.g. load, temperature, and contact condition, on tooth root fatigue failure

Sebastjan Matkovič, M. Sc., Researcher, Laboratory for Tribology and Interface Nanotechnology – TINT, Faculty of Mechanical Engineering, University of Ljubljana, Slovenia

16:30 The effect of gear manufacturing quality on the mechanical and thermal state of a plastic gear

- Considering the plastic gear quality in design calculations
- Effect of lead and pitch deviation was evaluated
- Effects on root crack propagation were studied

Assist. Prof. Damijan Zorko, PhD, Senior Scientist, Laboratory for Engineering Design LECAD, Faculty of Mechanical Engineering, University of Ljubljana, Ljubljana, Slovenia

17:00 Improved Method for the validation of root stress in polymer Gears

- Shortcomings of existing polymer material data for gears
- Review of the strengths and weaknesses of existing design standards
- Development of an improved root stress calculation method using single tooth bend test data

Dominic Gallagher, BEng IEng MIMechE, Application & Design Engineer (Gears), Research & Development, Victrex Manufacturing Ltd., Thornton-Cleveleys, United Kingdom; Eric Wiita, B. Sc., NPI Project Manager, Victrex, dba Kleiss Gears, Inc., Grantsburg, USA; Dipl.-Ing. Ralf Weidig, Global Program Manager – Gears, Victrex Europe GmbH, Hofheim, Germany

End of the lectures

You are invited!

Get-together

17:30 Evening reception at the university

We are pleased to invite you to our evening reception at the end of the first conference day. Enhance your personal network and use the relaxed and informal atmosphere for deepening talks with other participants and speakers.

Source: Uli Benz/TUM

The conference will give you the answers to these questions:

- How can the carbon footprint of plastic gears be assessed and optimized?
- How can plastic gears be recycled?
- How can lubrication improve the performance of plastic gears?
- How can the NVH-behavior of plastic gears be evaluated and optimized?
- How does the manufacturing process impact gear performance and cost?

2nd Conference day

Thursday, September 14th, 2023

Fibre reinforcement

Moderation: Ingo Decker, M. Eng., Gear Development, Group Wide Components, Corporate Research & Development, ZF Friedrichshafen AG, Friedrichshafen, Germany

08:30 Prediction of gear fatigue life considering fiber orientation

- Effect of fiber orientation in the prediction of fiber reinforced gear
- Using actual gear specimen based on VDI 2736 to receive S-N curves
- Comparison of the predicted fatigue life to the measured S-N curve

Kazuma Yanagisawa, B. Sc., Development Engineer, Genestar Division, Research and Development Department, KURARAY CO., LTD., Tsukuba, Japan

09:00 Analytical tooth root stress calculation for short fiber-reinforced plastic gears

- Bending stress calculation for non-homogeneous and anisotropic material
- Validation with Finite Element Analysis
- Proposal for extension of VDI 2736

Wassiem Kassem, M. Sc., Research Assistant, Prof. Dr.-Ing. Oliver Koch, Full Professor, Head of Institute, Jun. Prof. Dr.-Ing. Manuel Oehler, Junior Professor for Mechanical Drive Technology, Chair of Machine Elements, Gears and Tribology (MEGT), Department of Mechanical and Process Engineering, Rheinland-Pfälzische Technische Universität Kaiserslautern-Landau (RPTU), Kaiserslautern, Germany

09:30 Continuous prestressed reinforcement of plastic gear teeth and its effect on bending strength vs conventional reinforcement

- Directional fibre reinforcements in the 30-degree tangent to the root fillet area
- Experimental tooth root evaluation and comparison versus unreinforced gears
- FEA simulations of the reinforced gear teeth

Georgios Vasileiou, M. Sc., Research Assistant, Design and analysis of structures and power transmission systems, Research Associate Laboratory of Machine Design and Dynamics, Christos Vakouftsis, M. Sc., Research Associate Laboratory of Machine Design and Dynamics, School of Mechanical Engineering, National Technical University of Athens, Greece; Vasilios Spitas, Ph.D., Ass.Professor, Member of Teaching and Research Personnel, School of Mechanical Engineering, National Technical University of Athens, Greece

10:00 Coffee break – meet & greet in the exhibition area, poster presentation area and GearArena

NVH

Moderation: Dr.-Ing. Marco Baccalaro, Chassis Systems Control, Gear Development and Test Conception/Realization, Robert Bosch GmbH, Heilbronn, Germany

11:00 NVH performance of thermoplastic gears: modelling and measuring

- Gear noise measurements on dedicated gear setup
- Advanced data postprocessing combined with dynamic modelling
- Noise measurements/modelling as a function of wear

Benjamin van Wissen, M. Sc., CAE Expert/Scientist, Research and technology, Dr. ir. Leonid Pastuhkov, Scientist, Research and technology, Adnan Hasanovic, M. Sc., System Expert Gears and Actuators, Envalior, Geleen, The Netherlands

11:30 Evaluation of the NVH characteristics of gear drives with plastic gears by the forced response analysis
- Investigation of the effect of the gear mesh damping on the NVH properties of gear drives
- Forced response analysis of gear drives due to the transmission error excitation
- Improvement of the NVH characteristics in gear drives with plastic gears

Prof. Dr.-Ing. Saeed Ebrahimi, Software Developer, Dr.-Ing. Ulrich Kissling, President, Sebastjan Matkovič, M. Sc., Software developer, KISSsoft AG, Bubikon, Switzerland

12:00 Optimization of the vibrational behavior of crossed helical gears with a plastic wheel and a steel worm
- FE generator with nodes in the normal section
- Automated FE-Evaluations at different angular gear positions
- Determination of the tooth stiffness with a plastic wheel

Christian Kirchhoff, M. Sc., Research Assistant, Chair of Industrial and Automotive Drivetrains (IFA), Faculty of Mechanical Engineering, Ruhr-University Bochum, Germany

12:30 Time for working lunch – meet & greet in the exhibition area, poster presentation area and GearArena

Manufacturing and operating properties

Moderation: Dr.-Ing. Andreas Langheinrich, Development Drive Technology, Horst Scholz GmbH & Co. KG, Kronach, Germany

14:00 Influence of the injection molding process on the operating properties of plastic gears
- Detailed analysis of the operating behavior using a novel gear test rig
- Interaction of production process parameters and gear properties
- Effect of production process induced gear properties on the operating behavior

Christoph Herzog, M. Sc., Scientific Assistant in the field of Tribology, Institute of Polymer Technology, Friedrich-Alexander-University FAU, Erlangen, Germany

14:30 Experimental investigation on plastic gear NVH behavior
- Plastic vibration damping properties
- Influence of gear quality, torque, RPM, temperature, material fillers and base resin
- Fast fourier transform analysis

Dr. Julien Cathelin, Sr. Technical Development Engineer, SABIC Specialties, Bergen op Zoom, The Netherland

15:00 New generation in plastic gear technologies
- Material saving due to ommited sprues
- Gear quality, improved radial composite deviation, tangential composite deviation, roundness of the gears
- Cost and time saving due to ommited sprues and less optimization loops

Dipl.-Ing. (FH) Philipp Michel, Product manager, Process Planning, Dipl.-Ing. (FH) Joseph Hackel, Head of process development, Weißer + Grießhaber GmbH, Mönchweiler, Germany

15:30 Coffee Break – meet & greet in the exhibition area, poster presentation area and GearArena

Gear geometry and calculation

Moderation: Dr.-Ing. Ulrich Kissling, President, KISSsoft AG, Bubikon, Switzerland

16:30 A non restricive approach of gear geometry calculation for plastic gears
- Introducing common kinematic calculation model
- Surface calculation highly variable gearing geometry
- Skewed axis planetary gear as example for disruptive thinking

Florian Eigner, M. Sc., Development Engineer, imk Health Intelligence GmbH, Chemnitz; Univ.-Prof. Dr.-Ing. Maik Berger, Professor, Faculty Mechanical Engineering, Chemnitz University of Technology; Dipl.-Ing. Stephan Oberle, Director R&D, IMS Gear SE & Co. KGaA, Donaueschingen, Germany

17:00 Applicability of classic analytical calculation approaches for the design of plastic gears
- Calculation of load carrying capacity of plastic gears
- Comparison of numerical and analytical calculation approaches
- Estimation of applicability of numerical approaches

Markus Rothemund, M. Sc., Research Associate, Institute of Machine Elements, Gear Research Center (FZG), TUM School of Engineering and Design, Technical University of Munich, Garching, Germany

17:30 ZC-geometry in crossed helical gears – simulative studies and experimental results
- Non-involute geometries to the increase load carrying capacity
- Design guidelines for non-involute crossed helical gears
- Experimental results on the wear behaviour of a ZC-geometry

Linda Becker, M. Sc., Research Assistant, Prof. Dr.-Ing. Peter Tenberge, Head, Chair of Industrial and Automotive Drivetrains (IFA), Faculty of Mechanical Engineering, Ruhr-University Bochum, Germany

18:00 End of the lectures
- Switch to the plenary session –

18:05 Dinner speech by

What is the taste of gears like?
Dr.-Ing. Bernhard Bouché, Director of Research and Development Mechanics, Getriebebau NORD GmbH & Co. KG, Bargteheide, Germany

18:45 Organized bus transfer to the evening reception

You are invited!

Get-together

19:30 Evening reception at the 'Löwenbräukeller' in Munich

You can look forward to a special evening event. We cordially invite you to our evening reception at the 'Löwenbräukeller' and to enjoy tradition. Enhance your personal network and use informal atmosphere for deeper-going discussions.

Source: Löwenbräukeller Archiv

3rd Conference day
Friday, September 15th, 2023

Performance and validation of plastic gears
Moderation: Ingo Decker, M. Eng., Gear Development, Group Wide Components, Corporate Research & Development, ZF Friedrichshafen AG, Friedrichshafen, Germany

08:30 Evaluation of specialty polymer performances in gear applications and the bias between modeling and testing approaches
- Evaluation of IXEF 1002 and AMODEL A-1133 gears performances
- Modeling approach to predict abrasive wear in Amodel PPA gears
- Influence of part tolerances on performances

Benoit Devaux, Mech. Eng., Virtual Engineering Roadmap Leader, Application Development Labs (ADL), Solvay Material Science Application Center, Solvay Sa., Brussels, Belgium; Christine Hamon, Chem. Eng., ADL F&W Competence Leader, ADL, Stefano Montani, Materials Engineer, Marketing Manager Transportation, Solvay Sa., Bollate, Italy

09:00 Experimental verification of high-performance polymer gears in an electric vehicle powertrain
- Use of polymer gears in applications with high power transmission
- Substitution of steel gears by polymer gears
- Experimental investigations of the load-carrying capacity under operating conditions close to those of the application

Stefan Reitschuster, M. Sc., Research Associate, Dr.-Ing. Thomas Tobie, Head of Department, Department Load-Capacity Cylindrical Gears, Institute of Machine Elements, Gear Research Center (FZG), TUM School of Engineering and Design, Technical University of Munich, Garching, Germany

09:30 Influence of plastic-metal-pairings on the lifetime of gears
- Tooth modifications of plastic metal gear pairings
- Influence of gear body design on lifetime of gear meshing
- Validation of theoretical tooth modifications using FE-Analysis and comparing with test results

Sebastian Birk, M. Sc., Senior Technology Expert, R&D, Veronica Labriola, B. Eng., Senior Technology Expert, R&D, Eugen Stoppel, M. Eng., Senior Technology Expert, R&D, IMS Gear SE & Co. KGaA, Donaueschingen, Germany

10:00 Coffee break – meet & greet in the exhibition area, poster presentation area and GearArena

Tribology and thermal behavior
Moderation: Dr.-Ing. Marco Baccalaro, Chassis Systems Control, Gear Development and Test Conception/Realization, Robert Bosch GmbH, Heilbronn, Germany

11:00 Sustainability concept of high-performance polymers using the example of Polyamide12
- Carbon footprint reduction
- Alternative sources of feedstock
- Recycling

Dipl.-Ing. (FH) Philipp Kilian, Head of Tribology Development, RD&I High Performance Polymers, Evonik Operations GmbH, Darmstadt, Germany; Maximilian Rothe, M. Sc., Senior OEM Manager, High Performance Polymers – Automotive & Mobility, Florian Hermes, M. Sc., Sustainable Business Solutions, High Performance Polymers – Evonik Operations GmbH, Marl, Germany

11:30 Reduction of root and flank temperature using a hybrid polymer-metal rack
- A hybrid polymer-metal rack is proposed
- A stationary test is used to validate the concept
- The hybrid concept decreased the flank and root temperature

Carlos Fernandes, PhD, Assistant Professor, INEGI – Institute of Science and Innovation in Mechanical and Industrial Engineering, Porto, Portugal

12:00 In-situ experimental methods for measuring tooth meshing displacements and wear during polymer gear tests using a high-speed camera with microscopy optics
- Digital image correlation method used for tooth displacement detection
- Newly proposed profile detection and dimensioning method used for displacement and wear analysis
- Displacements and wear can be measured across entire tooth profile

Dr. Borut Cerne, Senior Researcher, Laboratory for Engineering Design, Faculty of Mechanical Engineering, University of Ljubljana, Slovenia

12:30 Closing remarks

12:45 Awarding of the best presentation for young engineers by the conference president

Prof. Dr.-Ing. Karsten Stahl, Gear Research Center (FZG), TUM School of Engineering and Design, Technical University of Munich, Garching, Germany

Awarding of the best paper by

Dr.-Ing. Franz Völkel, Sr. Vice President R&D Bearings, Schaeffler Technologies AG & Co. KG, Herzogenaurach, Germany

+ Lunchtime snack

14:15 End of the conference

Presidency

Prof. Dr.-Ing. Karsten Stahl, Full Professor, Institute of Machine Elements, Director, Gear Research Center (FZG), TUM School of Engineering and Design, Technical University of Munich, Garching, Germany

Conference board

Highly committed and with a great passion to succeed, the program committee – consisting of the following experts – draws up the conference agenda for you.




from left to right:

Dr.-Ing. Marco Baccalaro, Chassis Systems Control, Gear Development and Test Conception/Realization, Robert Bosch GmbH, Heilbronn, Germany

Ingo Decker, M. Eng., Gear Development, Group Wide Components, Corporate Research & Development, ZF Friedrichshafen AG, Friedrichshafen, Germany

Dr.-Ing. Ulrich Kissling, President, KISSsoft AG, Bubikon, Switzerland

Dr.-Ing. Andreas Langheinrich, Development Drive Technology, Horst Scholz GmbH & Co. KG, Kronach, Germany

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Gears interactive – new ideas, more added value for your business

GearArena

Gather hands-on experience in the transmission world!

Take a look at individual gear components, gain an insight into how the different components interact and compare design and workmanship!
You will find an on-site contact person from the exhibitor to answer all your questions.

FZG lab tours

Get the chance to visit innovative laboratory facilities!

Seize the opportunity and visit the nearby test and laboratory facilities at the Gear Research Center (FZG). Several guided tours with different core topics offer opportunities of gaining deeper insights into a variety of innovative gear test rigs and laboratory equipment.

For registration meet at the FZG information desk during the conference.

Speakers meetup

Do you still have unresolved questions?

You can address your questions to the speakers right after the lecture during the coffee break. Take the chance to say hello to your favorite speakers and to connect with them. They will be available for at least 15 minutes after their session.

Poster exhibition with impulse talks

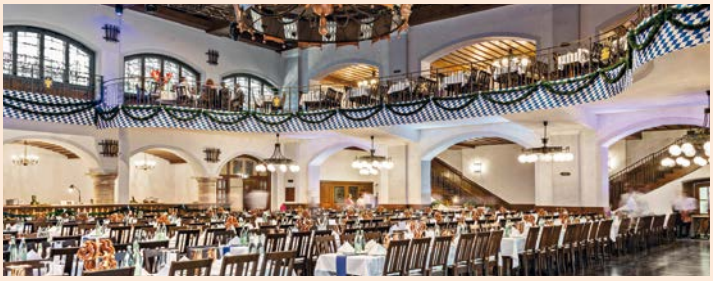
The poster exhibition is combined with a 5-minute talk.

The compact style of presentation called the '5-minute rapid' presentation, will provide you with all information in a clear, succinct manner. Poster presentations are scheduled during the coffee breaks. Presentation times will be announced on-site.

Two gear community nights

Your networking hotspot for the international gear community!

Enjoy the evening reception at the 'Löwenbräukeller' as well as another social event at the university. The 'Löwenbräukeller' is a restaurant with a long tradition offering modern Bavarian cuisine. Both – the get-together at the FZG and the brewery visit – offer you an excellent opportunity to network with your peers and catch up on trends.



Source: Löwenbräukeller Archiv

Venue:

Source: Scharger, Albert/TUM

Parallel conferences

Visit for free!

International Conference on Gears 2023

September 13 - 15, 2023, Garching/Munich, Germany

Source: © NORD DRIVESYSTEMS Group

Key topics:

- Sustainable gears with reduced carbon footprint and increased efficiency
- Optimization of gear design and geometry
- New test methods for endurance, efficiency and NVH behavior
- Numerical methods and multiscale simulation tools to improve gear performance
- Smart gears for condition monitoring systems and additional functions
- Life cycle assessment of geared drive systems

Presidency:

Prof. Dr.-Ing. Karsten Stahl, Full Professor, Institute of Machine Elements, Director, Gear Research Center (FZG), TUM School of Engineering and Design, Technical University of Munich, Garching, Germany
Dr.-Ing. Bernhard Bouché, Director of Research and Development Mechanics, Getriebebau NORD GmbH & Co. KG, Bargteheide, Germany
Prof. i.R. Dr.-Ing. Dr. h.c. Bernd-Robert Höhn, TUM emeritus of excellence, Gear Research Center (FZG), TUM School of Engineering and Design, Technical University of Munich, Garching, Germany
Dr.-Ing. Burkhard Pinnekamp, Head of Central Technology, RENK GmbH, Augsburg; President, Research Association for Drive Technology (FVA), Frankfurt, Germany

Further details and the final program can be found here:
www.vdi-gears.eu

Parallel conferences

5th International Conference on Gear Production 2023

September 13 - 15, 2023, Garching/Munich, Germany

Source: © WZL, RWTH Aachen/Ahmad

Key topics:

- Sustainable gear production
- Inline quality inspection for gear production
- Additive manufacturing of gears
- Performance of new gear materials in gear manufacturing
- Hard finishing of high performance gears
- Innovative processes for gear manufacturing

Presidency:

Prof. Dr.-Ing. Thomas Bergs, Full Professor, Laboratory for Machine Tools and Production Engineering (WZL), Chair of Manufacturing Technology, Faculty for Mechanical Engineering, RWTH Aachen University, Germany
Prof. Dr.-Ing. Christian Brecher, Full Professor, Chair of Machine Tools, Laboratory for Machine Tools and Production Engineering (WZL), Faculty for Mechanical Engineering, RWTH Aachen University, Germany
Prof. Dr.-Ing. Karsten Stahl, Full Professor, Institute of Machine Elements, Director, Gear Research Center (FZG), TUM School of Engineering and Design, Technical University of Munich, Garching, Germany

Further details and the final program can be found here:
www.vdi-wissensforum.de/02TA411023

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5th International Conference on High Performance Plastic Gears 2023

Methods for simulation and calculation of plastic gears

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Ticket includes entrance to the parallel conferences:
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• Gear Production 2023

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5th International Conference on High Performance Plastic Gears 2023
September 13–15, 2023, **Garching near Munich, Germany** (02TA409023)
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www.vdi-wissensforum.de/en/terms-and-conditions/

Venue:
Conference: Technical University of Munich, TUM School of Engineering and Design, Institute of Machine Elements, Gear Research Center (FZG), Boltzmannstr. 15, 85748 Garching, Germany, https://www.mec.ed.tum.de/en/fzg/contact-and-directions/fzg/
Hotel reservation: A limited number of rooms have been reserved for conference participants. For booking please visit **www.vdi-gears.eu** where you will find a link for special room rates.

More hotels close to the conference venue may be found via our HRS service,
www.vdi-wissensforum.de/hrs

HRS Das Hotelportal

Information: The price includes conference documents (e-book), coffee breaks and beverages during breaks, lunches and two evening receptions.

Exclusive offer: All participants at this event are entitled to a free three-month trial VDI membership. (Offer applies exclusively to new members.)

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