



Parallel conferences  
free of charge

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# 5th International Conference on Gear Production 2023

## Key topics discussed:

- 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**, WZL, RWTH Aachen University, Germany

**Prof. Dr.-Ing. Christian Brecher**, WZL, RWTH Aachen University, Germany

**Prof. Dr.-Ing. Karsten Stahl**, FZG, Technical University of Munich (TUM), Garching, Germany

## + Parallel events

International Conference on Gears 2023

International Conference on High Performance Plastic Gears 2023

## + Exhibition

## With experts from:



MENZ & CIE.



Event organized by VDI Wissensforum GmbH  
[www.vdiconference.com/02TA411023](http://www.vdiconference.com/02TA411023)  
 Phone +49 211 6214-201 • Fax +49 211 6214-154  
 #vdi\_gears

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

## 1st Conference day Wednesday, September 13<sup>th</sup>, 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

a representative, TUM School of Engineering and Design, 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<sub>2</sub> footprint in product specifications

- High performance and low emissions is no conflict for engineering steels
- Maximum CO<sub>2</sub> 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 Gear Production 2023



#### Innovations in gear production

**Moderation: 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

#### 13:30 Complete machining of complex transmission parts – Chance or risk for series production?

- Reduction of lead time and logistic costs
- Increase of complexity for machine operators
- Impact on process stability and quality assurance

**Dr.-Ing. Markus Brumm**, Associated Partner, Dr.-Ing. Deniz Sari, Associated Partner/Head of Division/Self Employed, Menz et Cie. GmbH, Frankfurt, Germany

#### 14:00 No value add without cost efficient double-flank-order-inspection: Back from end-of-line NVH to skiving process

- Key order correlation matrix: Limited negative regression, check of independency, hyperbolic distribution
- Skiving impact on gear NVH: Teeth ratio, lead feed rate, tool error
- NVH closed loop knowledge: End-of-line inspection, tool design and quality, skiving surface processing

**Dipl.-Ing. Thomas Kleiber**, Specialist Mechanical Engineering, Gears Process Engineering, Dr.-Ing. Benedikt Neubauer, Director Gears e-mobility, Schaeffler Technologies AG & Co. KG, Herzogenaurach, Germany

#### 14:30 Digitisation of gear production devices in gear production machines: Gear hobbing units in turning machines

- Digitisation and gear production in conventional turning machines
- Challenges for device monitoring (inside of tooling machines)
- Cost optimisation through preventive maintenance and improvement of process reliability

**Dipl.-Ing. Karl-Heinz Schoppe, MBA**, Innovation Manager, Innovation and Marketing, Mimat, Betzigau, Germany



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

## Software in gear production

**Moderation:** Dr.-Ing. Jens Brimmers, M. Sc., Chief Engineer Gear Department, Chair of Machine Tools, Laboratory for Machine Tools and Production Engineering (WZL), Faculty for Mechanical Engineering, RWTH Aachen University, Germany

### 16:00 Building a software toolchain for automated mass-customization of specific end-use gear unit parts using AM-driven design guidelines

- Design for additive manufacturing: Lowering part cost through lightweight, low-support design
- Design automation: Automating design processes to realize ETO parts with short lead times
- Topology Optimization based on load case analysis

**Tobias Jagiella, M. Sc.**, Development Engineer, Dr.-Ing. Markus Wöppermann, Head of Division, Development Gear Units, SEW-EURODRIVE GmbH & Co KG, Bruchsal, Germany

### 16:30 Securing the quality chain by the networking with the gear suppliers

- Problems with diverse gear quality evaluations in production
- Establishing a solution for all locations and suppliers
- Benefits for the internal production and suppliers

**Dr.-Ing. Herman Yakaria**, Advanced Expert Gear Manufacturing, Simulation, ZF Friedrichshafen AG, Friedrichshafen, Germany

### 17:00 Generation method of polygonal shaped work pieces based on gear meshing theory: Calculation scheme of conjugate shapes against target polygons

- Novel manufacturing scheme of shafts and holes having polygonal cross sections
- Capable to be implemented on existing 5-axis CNC machine tools to enhance their productivity
- Some criteria to assist finding suitable tool shape are discussed

**Daisuke Matsuura, Ph.D.**, Specially Appointed Associate Professor, Tsune Kobayashi, Ph.D., Specially Appointed Professor, JTEKT Innovative Generic Technology Joint Laboratory, Department of Mechanical Engineering, School of Engineering, Tokyo Institute of Technology, Japan

## End of the lectures



## 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

You are invited!

## 2nd Conference day Thursday, September 14<sup>th</sup>, 2023

## Additive manufacturing

**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



### 08:30 Spur gear repaired via direct laser deposition

- Direct laser deposition parameters for gear repair, such as scanning speed, laser power and powder feed rate.
- FZG load stages tests (K1 to K9) applied to repaired gears
- Teeth flank performance evaluation of direct laser deposition repairs for different load stages

**Pedro Romio, M. Sc.**, Researcher, Faculty of Engineering, INEGI – Institute of Science and Innovation in Mechanical and Industrial Engineering, Porto, Portugal

### 09:00 Binder jetting of gears process design and tooth root load capacity for gears made of 17-4PH

- Optimization of process parameters: Powder application, thermal processes, scaling
- Derivation of a SN-curve: Endurance/fatigue strength
- Tooth bending strength: Experimental pulsator tests, calculation of tooth root stresses

**Lukas Klee, M. Eng.**, Team Leader Gear Manufacturing, Prof. Dr.-Ing. Thomas Bergs, Full Professor, Chair of Manufacturing Technology, Dr.-Ing. Jens Brimmers, M. Sc., Chief Engineer Gear Department, Chair of Machine Tools, Laboratory for Machine Tools and Production Engineering (WZL), Faculty for Mechanical Engineering, RWTH Aachen University, Germany

### 09:30 Indirect selective laser sintering: Modeling and analysis of surface densification by shot peening

- Porosity and surface integrity analysis of iSLS samples
- AM samples densification by shot peening
- Modeling of shot peening densification by FEM

**Prof. Dr. Ronnie Rego**, Associate professor, Izabel Criscuolo, Eng., Research assistant, Felipe Carneiro, Eng., Research assistant, Mechanical and Automation Department, Aeronautics Institute of Technology, São José dos Campos, Brazil



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

## Materials in gear production

**Moderation:** Dr.-Ing. Jens Brimmers, M. Sc., Chief Engineer Gear Department, Chair of Machine Tools, Laboratory for Machine Tools and Production Engineering (WZL), Faculty for Mechanical Engineering, RWTH Aachen University, Germany



### 11:00 Estimation of brittleness of CCH-steel via measurement of micro-VH and simultaneous FWHM distribution

- Definition of effective tooth flank form deviation
- FWHM drops while the hardness keeps harder value
- Tensile stress can appear in the case of heavily carburized and hardened gear teeth

**Prof. Dr. Aizoh Kubo**, President and Head of Innovation Management, Masahiro Nagae, PhD, Head of material testing, RIAS Research Institute of Applied Sciences, Kyoto, Japan



### 11:30 Investigation of the machinability of different quenched and tempered steels for the alternative process chain of planetary in wind turbine gearboxes

- New quenched and tempered steels in different tempering states
- Investigation of various cutting substrates: Carbide, powder metallurgical high speed steel (PM-HSS), Fe-Co-Mo alloys
- Recommendations of process parameters for each material – substrate combination

**Steffen Hendricks, M. Sc.**, Research Assistant, Gear Manufacturing, Prof. Dr.-Ing. Thomas Bergs, Full Professor, Chair of Manufacturing Technology, Dr.-Ing. Jens Brimmers, M. Sc., Chief Engineer Gear Department, Chair of Machine Tools, Laboratory for Machine Tools and Production Engineering (WZL), Faculty for Mechanical Engineering, RWTH Aachen University, Germany

### 12:00 Investigating different nodular graphite irons for the application of gears – a step towards standardization by using reasonable quality criteria

- Tooth root bending strength and slow speed wear behaviour
- Different variants of ADI-900-8 and GJS-700-2 tested
- Suitable quality criteria such as graphite density defined

**Dr.-Ing. Jochen Lohmiller**, Development Gear Units, Dr.-Ing. Florian Dobler, Head of Department, Materials Technology, Dr.-Ing. Markus Wöppermann, Head of Division, Development Gear Units – SEW-EURODRIVE GmbH & Co. KG, Bruchsal, Germany

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

### Modeling and tracing of gear manufacturing processes

**Moderation: Dr.-Ing. Joachim Thomas**, Managing Director, ZG Hypoid GmbH, Aschheim, Germany

### 14:00 Gear skiving with minimum twist errors

- Process simulation with workpiece quality in focus
- Tool design to minimize natural twist errors
- Axis control to minimize twist errors

**Andreas Hilligardt, M. Sc.**, Research Associate, Prof. Dr.-Ing. habil. Volker Schulze, Director, Manufacturing and Materials Technology, wbk Institute of Production Science, Karlsruhe Institute of Technology (KIT), Germany

### 14:30 The next level of axial forming for a sustainable component and process chain design: A chipless manufacturing of helical gears

- Resource- and energy-efficient manufacturing processes
- Innovative alternative to machining operation in processing
- CO<sub>2</sub>-reduction of geared drive components

**Dr.-Ing. Nadezda Missal**, Head of Innovation Center, Felss Group GmbH, Pforzheim, Germany

### 15:00 Enhancing gear performance through advanced mass finishing and DEM simulation

- Performance optimisation through topography, microstructure and introduced compressive stress
- Influence on fatigue behaviour and efficiency
- Additional results and outlook on the improvement potential using DEM simulation

**Florian Reinle, M. Sc.**, Process engineer – Simulation & Tribology, Process Development, OTEC Präzisionsfinish GmbH, Straubenhardt, Germany; Davide Mangherini, Mech. H.S., Tribology and Surface Treatment Specialist, Materials & Sustainability Engineering, Stellantis N.V., Turin, Italy; Andrea Bongiovanni, M. Sc., PhD researcher, University of Turin, Italy

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

### Gear metrology

**Moderation: Dr.-Ing. Jens Brimmers, M. Sc.**, Chief Engineer Gear Department, Chair of Machine Tools, Laboratory for Machine Tools and Production Engineering (WZL), Faculty for Mechanical Engineering, RWTH Aachen University, Germany



### 16:30 Quality inspection of special geometries measured with computed tomography – Evaluation of involute cylindrical gears according to ISO 1328-1

- Evaluation of measured point clouds with best practice methods
- Quality inspection of point clouds representing special geometries
- Presentation of results of evaluated plastic gears measured with computed tomography

**Dr.-Ing. Karsten Lübke**, Software development special geometries, Hexagon Metrology GmbH, Wetzlar, Dipl.-Ing. Klaus Stein, Research Engineer, Technology & Innovation, Fa. Werner Bauser GmbH, Wehingen, Germany

### 17:00 Large gear metrology

- Standards for the traceability of large gears
- Measurement strategies for the calibration of large gears: Multiple orientation technique, substitution measurement, Scanning vs. single-point measurements
- Calibration services for the industry: Large scale, gear measurand, measurement uncertainties

**Dipl.-Ing. (FH) Achim Wedmann**, Technical Engineer, Dr. rer. nat. Martin Stein, Head, Working Group "Gears and Treads", Dr.-Ing. Karin Kniel, Head, Department „Coordinate Metrology“, Physikalisch-Technische Bundesanstalt Braunschweig, Germany

### 17:30 Optimizing of product quality and manufacturing processes in real time with vibration analysis

- Challenges in the optimization of product quality in gear manufacturing
- Functionality and structure of a real-time vibration analysis system
- Findings and savings opportunities from practice

**Dipl.-Wirtsch.-Ing. (FH) Sebastian Held**, Senior Sales Consultant, Sandro Moschkau, Product Owner, Portfolio Management, Schaeffler Digital Solutions GmbH, Chemnitz, Germany

### 18:00 End of the lectures

– Switch to the plenary session –

### 18:05 Dinner speech



### What is the taste of gears like?

**Dr.-Ing. Bernhard Bouché**, Director of Research and Development Mechanics, Getriebbau NORD GmbH & Co. KG, Bargteheide, Germany

### 18:45 Organized bus transfer to the evening reception



Get-together

You are invited!

### 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 15<sup>th</sup>, 2023



### Sustainability and surface integrity

**Moderation: 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

#### 08:30 Sustainable steel production: A life cycle assessment of hot-rolled bars

- Steel with high performance and low emissions is no conflict
- CO<sub>2</sub> as a property in the value chain
- Above 95 % recycled content ensures a high level of circularity

**Patrik Ölund, M. Sc.**, SVP, Head of Group R&D, Elias Löthman, M. Sc., Senior R&D Engineer – Applications, Group R&D, Erik Claesson, M. Sc., Head of Automotive Segment, Ovako AB, Hofors, Sweden

#### 09:00 Deep rolling of the tooth root in the kinematics of gear skiving

- Highly productive mechanical optimization of the tooth root: deep rolling in skiving kinematics
- Reduced micro-notch effect due to smoothed roughness
- Increased tooth root strength due to mechanical surface strengthening

**Patrick Fischmann, M. Sc.**, Research Associate, Andreas Hillgardt, M. Sc., Research Associate, Prof. Dr.-Ing. habil. Volker Schulze, Director, Manufacturing and Materials Technology, wbk Institute of Production Science, Karlsruhe Institute of Technology (KIT), Germany

#### 09:30 Surface integrity of 20MnCr5 pinion gears manufactured through laser powder bed fusion

- Additive Manufacturing (AM): Use of cutting edge technology
- Surface Integrity: Achieving load carrying capability in additive manufacturing
- AM Finishing: How AM gears differ from wrought steel in regarding finishing operations

**Guilherme Fernandes Guimarães, M. Sc.**, Researcher, Prof. Dr. Ronnie Rego, Professor, Prof. Dr. Alfredo Faria, Professor, Mechanical Engineering, Technological Institute of Aeronautics, São Paulo, Brazil



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



### Manufacturing processes

**Moderation: 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

#### 11:00 The Magic Cutter – An economical solution for bevel and hypoid gear production based on the modular principle

- Consolidation of blade geometry
- Lean production of bevel and hypoid gears: no cutter change by producing different gears from the same ratio
- Cost reduction: lower investment for tooling. Reducing of machine set-up time

**Dr.-Ing. Christo Braykoff**, Senior Manager Gear Calculation/Head of gear calculation, Engineering Axle, MAN Truck & Bus SE, Munich; Dr.-Ing. Joachim Thomas, Managing Director, ZG Hypoid GmbH, Aschheim, Germany

#### 11:30 Application-oriented research on internal generating polishing

- Continuous generating process for internal gears
- Influence of polishing process parameters
- Evaluation by geometry, surface features, grinding burn

**Noritaka Fujimura, M. Sc.**, Engineering manager, NIDEC MACHINE TOOL CORPORATION, Ritto, Japan; Patrícia de Oliveira Löhrer, M. Sc., Research Assistant, Gear Hard Machining, Gear Department, Laboratory for Machine Tools and Production Engineering (WZL), Faculty for Mechanical Engineering, RWTH Aachen University, Germany



#### 12:00 Track and trace via fingerprint

- Marker free identification for process optimization
- Image based recognition of individual parts
- Inline tracking and tracing

**Dr. Tobias Schmid-Schirling**, Group Manager Inline Vision Systems, Norbert Saum, M. Sc., Development Engineer, Christoph Eberz, B. Sc., Development Engineer, Production control, Fraunhofer Institute for Physical Measurement Techniques IPM, Freiburg, Germany



#### 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

## Reasons why you should visit the conference:

- Challenges of manufacturing of high performance gears
- Increasing the sustainability in gear manufacturing
- Best practices for manufacturing of new gear materials
- Digital solutions for the gear production
- Unique platform for international community of gear manufacturing experts

## 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

## Scientific support:

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[www.vdi.eu](http://www.vdi.eu)

## 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



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#### 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, Getriebbau 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](http://www.vdi-gears.eu)



## Parallel conferences

### 5th International Conference on High Performance Plastic Gears 2023

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



Source: © HORST SCHOLZ GmbH & Co. KG

#### Key topics:

- 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

#### Conference Board:

**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

Further details and the final program can be found here:

[www.vdi-wissensforum.de/02TA409023](http://www.vdi-wissensforum.de/02TA409023)

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Vanessa Ulbrich

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(April 2023)

## 5th International Conference on Gear Production 2023

VDI Wissensforum GmbH | VDI-Platz 1 | 40468 Duesseldorf | Germany

New trends for the gear  
producing industry

You need help?  
Please contact us!

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**Ticket includes entrance to  
the parallel conferences:**  
• Gears 2023  
• High Performance Plastic  
Gears 2023

✓ Please register for (price per person plus VAT):

5th International Conference on Gear Production 2023
September 13–15, 2023, Garching near Munich, Germany (02TA411023)
EUR 1,690.-

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[www.vdi-wissensforum.de/en/terms-and-conditions/](http://www.vdi-wissensforum.de/en/terms-and-conditions/)

**Venue:** 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](http://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](http://www.vdi-wissensforum.de/hrs)

**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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