

Industrial Research and  
Science in Dialogue  
with Practical Application

# BEARING WORLD

International Bearing Conference  
6-7 March, 2018 in Kaiserslautern, Germany

[www.bearingworld.org](http://www.bearingworld.org)

**Experience an International Industry Event in a Class of its own:  
The Expert Forum for Bearings – Rolling and Plain Bearings!**

**Join in:** industrial research and science in dialogue with practical application.

**Exchange ideas:** with the top representatives of the field, from research and industry, national and international.

**Bring yourself up-to-date with the current state of the art!**

## What to expect from this new information and networking platform:

- For whom?** All experts in the field of bearings, rolling and plain bearings
- Unique:** Presentations by top international speakers
- Rewarding:** Present your company to interested experts at the technical exhibition
- Networking:** Get to know leading national and international experts and make new contacts
- Be there:** Register today!

>> The World of Bearings – key topics: Innovative concepts ++  
White Etching Cracks (WEC) ++ Reliability and functional safety ++  
Tribology and energy ++ Damage diagnosis and avoidance ++ other issues



Prof. Gerhard Poll,  
Leibniz University  
Hannover, Germany,  
Bearing World Program  
Committee Speaker

*"Come to Bearing World, the international expert forum dedicated to bearings. Rolling bearings are still the main focus, but this year we will also include an interesting look at plain bearings. The conference provides a comprehensive overview of the current state of technology, research, and development as well as an opportunity to engage in dialog with leading national and international experts."*

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Antriebstechnik



## Program

6 March, 2018: 9:30 – 18:00, Evening Event at 19:30

### > Opening

Prof. Gerhard Poll, Leibniz University Hannover,  
Institute of Machine Design and Tribology (IMKT), Germany  
Prof. Bernd Sauer, University of Kaiserslautern,  
Institute of Machine Elements, Gears and Transmissions (MEGT), Germany  
Christian Kunze, Forschungsvereinigung Antriebstechnik e. V. (FVA), Germany

### > Keynotes

Title TBD

Dr. Victoria van Camp, SKF Group, Sweden

Shaping the mobility for tomorrow through innovation  
bearing technology for a smarter, cleaner and safer world

Prof. Dr. Tim Hosenfeldt, Schaeffler Technologies AG & Co. KG, Germany

### > Energy efficiency

Investigation of the frictional torque and  
temperature behavior of tapered roller bearings

Marco Schwarz, ZF Friedrichshafen AG, Germany  
Co-author: Jürgen Liebrecht, Technische Universität Kaiserslautern,  
Institute of Machine Elements, Gears and Transmissions (MEGT), Germany

Friction losses optimized rolling bearing for substitution  
of highly loaded tapered rolling bearings

Prof. Bernd Sauer  
Co-author: Margarita Marmol Fernandez  
University of Kaiserslautern, Institute of Machine Elements,  
Gears and Transmissions (MEGT), Germany

Development and efficiency testing of new generation  
„High Efficiency“ tapered roller bearings to meet efficiency of  
angular contact ball bearings on pinion shafts

Thorsten Klähn  
Co-authors: Jean Merckling; Dragos Opreescu, Timken Europe, France  
Mike Gromosiak, Caleb Chovan, Timothy Crabill, The Timken Company, France

Temperature behavior of rolling bearings exposed  
to centripetal acceleration

David Hochrein  
Co-authors: Dr. Stephan Tremmel; Prof. Sandro Wartzack  
Friedrich-Alexander-Universität Erlangen-Nürnberg, Engineering Design,  
Germany; Oliver Graf-Goller, Schaeffler Technologies AG & Co. KG, Germany

### > Failure modes

Formation of White Etching Cracks under rolling loading  
and the detection of preliminary stages

Dr. Ralf Martin Dinter, Flender GmbH, Germany  
Co-author: Francisco Gutierrez Guzman, RWTH Aachen University,  
Institute for Machine Elements and Machine Design (IME), Germany

WEC failure at the inner ring of roller bearings  
under dynamic conditions

Prof. Hubert Schwarze, Clausthal University of Technology,  
Institute of Tribology and Energy Conversion Machinery, Germany  
Co-author: Dr.-Ing. Jörg Loos, Schaeffler Technologies AG & Co. KG, Germany

The relation of White Etching Cracks  
with (very) high cycle fatigue

Dr. Reinder Hindrik Vegter  
Co-author: Junbiao Lai  
SKF Research & Technology Development, Netherlands

Evolution of White Etching Cracks during bearing tests

Steve Ooi, University of Cambridge, United Kingdom

Lubricant influences on the formation of  
White Etching Cracks (WEC)

Dr. Christoph Mayer, Klüber Lubrication München SE & Co. KG, Germany

Camshaft ball bearing WEC premature failure on simplified  
component test: suitable bearing design and improved test  
with representative boundary conditions

Marc Paquien, NTN-SNR Roulements, France

Differences between brinelling marks, false brinelling and  
standstill marks

Markus Grebe, Competence Center for Tribology at the Mannheim University of  
Applied Sciences, Germany

Solutions to reduce wear in wind turbine blade bearings

Fabian Schwack, Leibniz Universität Hannover, Institute of Machine Design and  
Tribology (IMKT), Germany  
Co-author: Matthias Stammer, Fraunhofer Institute for Wind Energy  
and Energy System Technology (IWES), Germany

Relationship of smearing criteria and  
transient lubrication analysis

Prof. Wen Wang  
Co-author: Liang Guo  
Shanghai University, China



*“Bearings are the heart of every machine or device with  
moving parts. With presentations from international  
experts, Bearing World offers up-to-date knowledge rela-  
ted to rotating equipment and its care and maintenance.”*

*Performance and reliability are the central topics of Bearing World.”*  
Bernd Stephan, AB SKF, Gothenburg, Sweden; CTO SKF Group

### Program Committee

Dirk Arnold, Forschungsvereinigung Antriebstechnik e.V., Germany  
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Engineering Design, Germany  
Prof. Sandro Wartzack, KTMfK University of Erlangen-Nürnberg, Germany  
Andreas Weber, Vestas Nacelles Deutschland GmbH, Germany  
Prof. Dr. Hans-Werner Zoch, IWT Stiftung Institut für Werkstofftechnik, Germany



## Program

7 March, 2018: 8:30 – 16:15

### > Bearing calculation and dimensioning

#### Miscellaneous Engineering Approaches to contact elasticity calculations

Luc Houpert, The Timken Company, France

#### Non-linearly coupled modelling of spindle bearing systems

Jens Falke

Co-authors: Prof. Christian Brecher; Marcel Fey  
RWTH Aachen, Laboratory for Machine Tools and  
Production Engineering (WZL), Germany

#### Dealing with the bearing design gap under mixed friction conditions

Dr. Nadine Nagler

Co-author: Daniel Hast  
Bosch Rexroth AG, Germany

#### Development and investigation of a simulation-driven preloading process for bearing installation

Philipp Abele

Co-author: Ermalt Lamaj, Dr. Jörg Hermes  
SEW-Eurodrive GmbH & Co. KG, Germany

#### Influence of geometric form deviations on operating parameters in hydrodynamic bearings

Marko Ebermann

Co-author: Prof. Erhard Leidich  
Chemnitz University of Technology, Department of Mechanical Engineering,  
Institute of Design Engineering  
and Drive Technology, Germany

#### Is surface texturing really efficient in hydrodynamic sliding bearings?

Prof. Michel Fillon

University of Poitiers, Institut Pprime, CNRS, France

#### Optimization and assessment of bearing running noise

Dr. Hannes Grillenberger

Co-author: Joachim Schleifenbaum  
Schaeffler Technologies AG & Co. KG, Germany

#### Radially preloaded cylindrical roller bearings – experimental studies regarding axial roller kinematic

Roman Böttcher

Co-author: Prof. Gerhard Poll  
Leibniz Universität Hannover, Institute of Machine Design and Tribology (IMKT),  
Germany

#### Experimental and numerical investigations of the durability of bearing cages

Dr. Robert Szlosarek, Technische Universität Bergakademie Freiberg,  
Institute for machine elements, design and manufacturing, Germany  
Co-author: Franz Pätzold, Kugel- und Rollenlagerwerk, Leipzig GmbH, Germany

#### Dynamic analysis of railway gearbox: from rotating system simulation to dynamics of a rolling bearing

Dr. Witold Marek Smolenski

Co-author: Dr. Andrei Degtiarev  
Schaeffler Technologies AG & Co. KG, Germany

### > Lab testing vs. field performance/validation

#### Experimental bearing cage vibration and corroboration with bearing cage dynamic modeling

Prof. Farshid Sadeghi

Co-author: Lijun Cao  
Purdue University, School of Mechanical Engineering, West Lafayette, (IN), USA

#### Investigation of rolling bearing condition monitoring techniques: a study based on long term run-to-failure vibration data

Reza Golafshan

Co-author: Prof. Georg Jacobs  
RWTH Aachen University, Institute for Machine Elements and Machine Design  
(IME), Germany

#### Testing of main bearings of wind turbine generator

Dr. Houssein Janbein

Co-author: Lutz Heuser  
Vestas Wind Systems, Germany

#### Hydrogen evolution in rolling contact

Dr. Dominik Kürten

Co-author: Dr. Andreas Kailer  
Fraunhofer Institute for Mechanics of Materials (IWM), Germany

#### Non-invasive load measurement of hertzian contact within a cylindrical roller bearing

Gary Nicholas

Co-author: Rob Dwyer-Joyce  
The University of Sheffield, United Kingdom



*"BEARING WORLD 2018 will bring together experts from research and industry in the fields of design, calculation, and the practical use of bearings. We anticipate around 40 high level presentations detailing the latest completed and ongoing research projects as well as reports from field operation. Come to Kaiserslautern, Germany, and meet the international experts!"*

Prof. Bernd Sauer, University of Kaiserslautern, Germany;  
Member of the BEARING WORLD program committee and scientific board

### Local Host

Prof. Bernd Sauer, MEGT University of Kaiserslautern, Germany

### Technical Sponsor

Forschungsvereinigung Antriebstechnik e.V.  
Lyoner Straße 18, D-60528 Frankfurt, Germany, [www.fva-net.de](http://www.fva-net.de)

### Organiser

FVA GmbH, Lyoner Straße 18, D-60528 Frankfurt, Germany, [www.fva-service.de](http://www.fva-service.de)

### Location

University of Kaiserslautern, Building 42 / Audimax  
Gottlieb-Daimler-Strasse, D-67663 Kaiserslautern, Germany

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## Program

7 March, 2018: 8:30 – 16:15

### > Lubrication

Base oil and grease effects on friction and film thickness in transition to mixed lubrication

Dr. Petr Šperka

Co-author: Ivan Krupka

Brno University of Technology, Czech Republic

Lubricant formulations in rolling bearing simulation based upon friction mapping results

Torben Fruth, FUCHS Schmierstoffe GmbH, Germany

Co-author: Dr.-Ing. Timo Kiekbusch, University of Kaiserslautern,

Institute of Machine Elements, Gears and Transmissions (MEGT), Germany

Observation of grease film evolution in rolling point contacts

Dr. Xinming Li, Qingdao University of Technology, China

Analyses of rheological behaviors based on a novel rheological model for the shear thinning lubricants

Ping Yang, Qingdao University of Technology,

School of Mechanical Engineering, China

Characterization of electrical lubricant properties for modeling of electrical drive systems with rolling bearings

Timo Kiekbusch

Co-author: Prof. Bernd Sauer, University of Kaiserslautern, Institute of Machine Elements, Gears and Transmissions (MEGT), Germany

### > Drive technology applications and challenges for bearings

The path of the common-mode currents: measures against damage of bearings caused by electrical discharge currents at large drives derived from latest field research results

Sven Tröger

Co-author: Prof. Matthias Kröger

Technische Universität Bergakademie Freiberg, Institute for Machine Elements, Engineering Design and Manufacturing, Germany

An experimental study of the effects of dynamic shaft movements on friction in cylindrical roller bearings

Andreas Meinel

Co-author: Dr. Stephan Tremmel

Friedrich-Alexander-Universität Erlangen-Nürnberg, Engineering Design, Germany

Interdisciplinary product development of optimized spherical roller bearings for wind main shaft applications

Andreas Bierlein, Schaeffler Technologies GmbH & Co. KG, Germany

Reliable calculation of slewing bearings for the industrial practice

Dr. Martin Neidnicht

Co-authors: Dr. Thomas Handreck; Dr. Bernd Lüneburg

thyssenkrupp Rothe Erde GmbH, Germany;

Dr. Thomas Griggel, Thomas Gellermann, Allianz Risk Consulting GmbH, Germany

An analytical method to account for spinning friction in axial ball bearings using the standard DIN ISO 281

Paul Sauvage

Co-authors: Christopher Sous; Prof. Georg Jacobs

RWTH Aachen, University, Institute for Machine Elements and Machine Design (IME), Germany

Martin Correns, Schaeffler Technologies AG & Co. KG, Germany

### > Life and durability

Bearing fatigue life of a multi-material shaft with an integrated raceway

Timm Coors

Co-author: Prof. Gerhard Poll

Leibniz Universität Hannover, Institute of Machine Design and Tribology (IMKT), Germany

The effect of retained austenite and carbide distribution on the wear resistance of the bearing raceway

Zeren Ozgeneci, ORS Bearings, Polatlı-Ankara, Turkey

Co-author: Bilgehan Ogel, Middle East Technical University, Metallurgical and Material Engineering Department, Turkey

Integrity assurance of silicon nitride balls for hybrid bearings

Junbiao Lai

Co-authors: Charlotte Vieillard; Yuri Kadin

SKF Research & Technology Development, Netherlands

A new through-hardenable high hardenability bearing steel designed by means of simultaneous optimisation of multiple responses using the desirability function approach

Dr. Urszula Sachadel

Co-authors: Mohamed Sherif; Boris Minov; Wijbe Buising

SKF, Netherlands

Evaluation of multiple-flaw failure of bearing steel 52100 in the VHCF regime and mathematical description of the single-flaw fatigue behavior

Dr. Klaus Burkart

Co-authors: Prof. Hans-Werner Zoch; Prof. Brigitte Clausen

Stiftung Institut für Werkstofftechnik (IWT) Bremen, Germany



*"Bearing World is the international expert forum for bearings. Here, researchers and developers from universities and bearing manufacturers come together in dialogue with users and experts from the industry. The goal is to align the drive system industry more closely to the requirements of the future. There can be no progress without modern drive technologies!"*

Dr. Arbogast Grunau, Corporate R&D Competence and Services, Schaeffler AG, Germany

### Exhibition

Present your company in the accompanying technical exhibition.

All relevant information can be obtained from the organisers.

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