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Bearing NEWS

BEARING INDUSTRY MAGAZINE

AGENDA FOR 2019 SPECIAL EDITION

ISSUE 201812 • P918438


**HANNOVER
MESSE**

**Bearing
EXPO &
Conference**

2019 EVENTS EXHIBITIONS CONFERENCES AGENDA

150 KEY
INDUSTRIAL EVENTS IN
45 COUNTRIES



SKF
JUNBIAO LAI

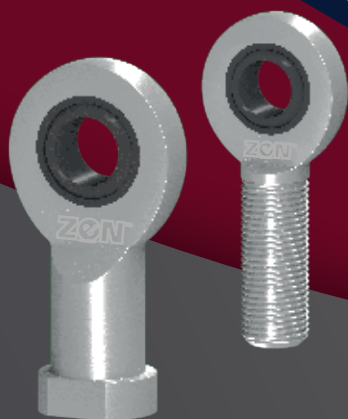
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1 Industry
3 Continents
4 Events
20 Speakers
100 Ideas &
Innovations

at Global
IAMD
Platforms

The BearingEXPO Conference at Hannover 2019

Both the market drivers and technical aspects of the bearing industry will be highlighted at the Bearing Conference series which will be held during Hannover Messe events in Hannover, Istanbul, Shanghai and the BearingEXPO event in Mumbai during 2019.

IAMD 2019: A world of solutions for smart factories

In 2019, the integration, digitization and interconnection of industrial technologies will transform the world's manufacturing industries more than ever before. In recognition of this, the IAMD show will feature the full range of products and solutions for the factory of the future, including factory and process automation systems, industrial IT, robotics, smart drives, and intelligent hydraulics and pneumatics systems.

All of the exhibits will share one unifying theme: "Industrial Intelligence", which is also the official lead theme for HANNOVER MESSE 2019. Artificial intelligence and machine learning are helping to eliminate production downtime, boost efficiency and ensure the seamless integration and operation of all the different parts that make up smart factories.

The over 200,000 trade visitors attending the upcoming HANNOVER MESSE will come from a diverse range of user industries. But most will come to the fair with the same clear objective in mind: to find the right state-of-the-art smart automation solutions for their manufacturing operations. For the companies they represent, digitization is the key to keeping their competitive edge.

BearingEXPO Conference at Hannover Messe 2019

Apart from the exhibits, trade visitors can look forward to a comprehensive supporting program of forums and special presentations, including the Bearing Conference at the Motion & Drives forum of the VDMA; where various commercial and technical bearing industry related topics will be presented.

The current drivers of the global bearing industry and what to expect in the future; the influences of globalization, consolidations, trade wars, multinational politics; an introduction to the development of bearing suppliers and quality control during purchasing will be highlighted during at the forum; followed

by more technical insights about how IIOT will optimize the bearing applications in the future; precision bearing engineering applied to high speed machinery; and the new forging technologies to optimize the lifetime of bearings.

The BearingEXPO Conference which will take place at the VDMA forum during Hannover 2019 show will be supported by the following companies:

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air bearings

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PCOMponents



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APLICADA, S.A. DE C.V.

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ENGINEERING



For 2019 the BearingEXPO & Conferences will be held at the following locations and dates below, feel free to contact info@bearing-expo.com for all your questions and program details.



ISTANBUL 2019 (Conference)
during WIN EURASIA *show*
14 – 17 March 2019



HANNOVER 2019 (Conference)
during Hannover Messe *show*
01 – 05 April 2019



MUMBAI 2019 (Exhibition, Conference & B2B Meetings)
during BearingEXPO & Conference India *show*
16– 17 October 2019



SHANGHAI 2019 (BearingEXPO Pavilion, Conference & B2B Meeting)
during PTC ASIA *show*
23– 26 October 2019



FVA-WORKBENCH 5.0

SETS NEW STANDARDS IN DRIVE SIMULATION

The FVA-Workbench combines new, powerful calculation methods and features for gearbox design with a user-friendly display of calculation results.

With the FVA-Workbench 5.0 published on July 17, 2018, FVA GmbH is setting new standards with its simulation platform for gearbox design. The new version of the software is characterized by increased overall performance, new features, even more powerful calculation methods, a user-friendly display of result data and the integration of the REXS interface for the simple exchange of gearbox data.



Development and Calculation Gear Units (MCGM), STÖBER Antriebstechnik GmbH + Co. KG.



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Right Location



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Right Quantity



Right Indicators



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Aerospace technology prolongs your bearing life

A beverage bottling plant was experiencing failures on the standard cam followers used in a case packer. Due to the environment, excessive corrosion was resulting in reduced bearing life, which required the cam followers to be replaced every three months.

The standard cam followers were replaced with McGill® CRES CAMROL® stainless steel cam followers, which were dimensionally interchangeable with standard cam followers.

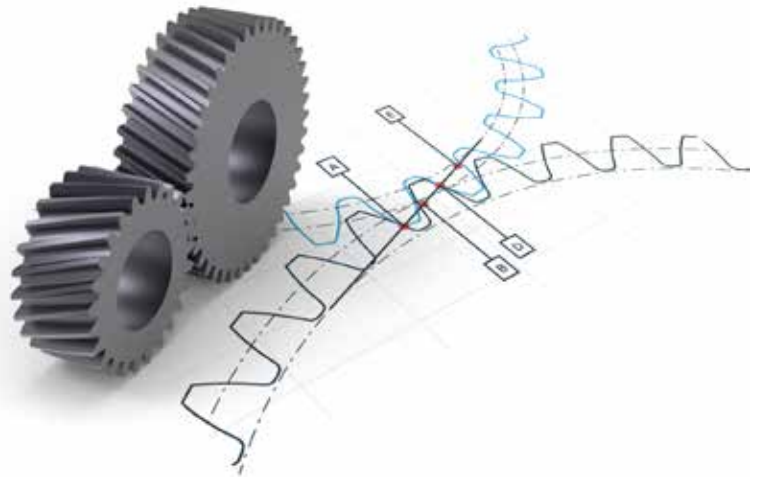
In addition to the standard McGill CAMROL cam follower bearing features, CRES CAMROL cam followers utilize stainless steel materials, LUBRI-DISC® + seals and H1 food grade grease. Our seal design incorporates aerospace technology to help prolong bearing life in a variety of corrosive environments.

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Dr.-Ing Hubert Schwarze, Combros R:
Dr.-Ing Thomas Hagemann, FVA 3333,
Combros A: Dipl.-Math. Christian Kraft,
FVA 2222) and are the result of many
years of basic research at FVA. Engineers
benefit from the highly professional
calculation of fixed and tilting segments
in the new feature, which takes into
account pressure, temperature and
turbulence influence. This allows these
influences to be completely mapped even
at highest speeds. The computational
core was developed at the Institute
of Tribology and Energy Conversion
Machinery at TU Clausthal and validated
on the high-performance test bench
of the FVA and Research Association
for Combustion Engines e.V. (FVV).



Coupling of FEM and analytical model: User-friendly and efficient

FVA-Workbench 5.0 supports engineers
with fast, user-friendly modeling for
analysis of complex gearbox systems.
In the calculation, analytical models of
machine elements can be coupled with
FEM structures and can be solved with

high performance by means of a solver
from the University of Bayreuth (Chair of
Design and CAD, Prof. Dr.-Ing. Frank Rieg,
Administrator: M.Sc. Christian Glenk,
FVA-Nr. 711 I RIKORplusZ88). In addition
to the gearbox housing, planet carriers
can now also be imported as FEM meshes,
positioned in the model and connected
to the gearbox model. To provide the

user with an efficient workflow, a CAD
model in various native formats can
now be imported directly instead of a
FEM mesh. The FEM meshing of the CAD
components is performed by the newly
integrated FEM Mesher. The user-friendly
meshing assistant supports this process
with automation, simple handling and
interactive user guidance. A slider

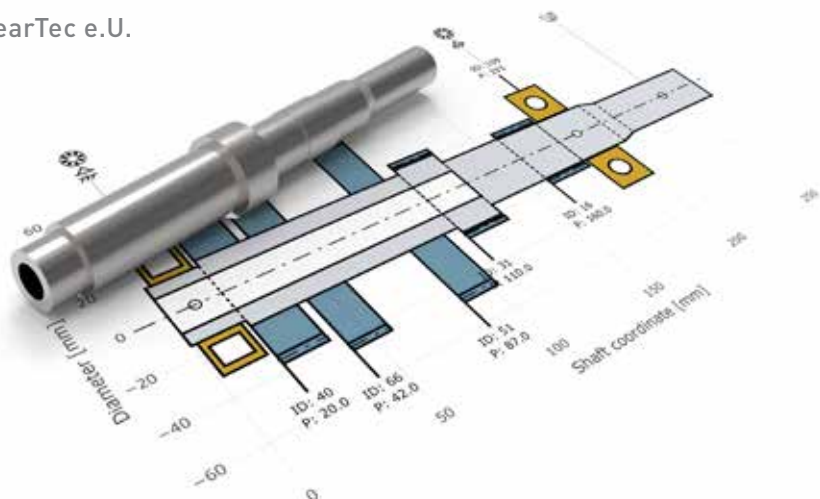
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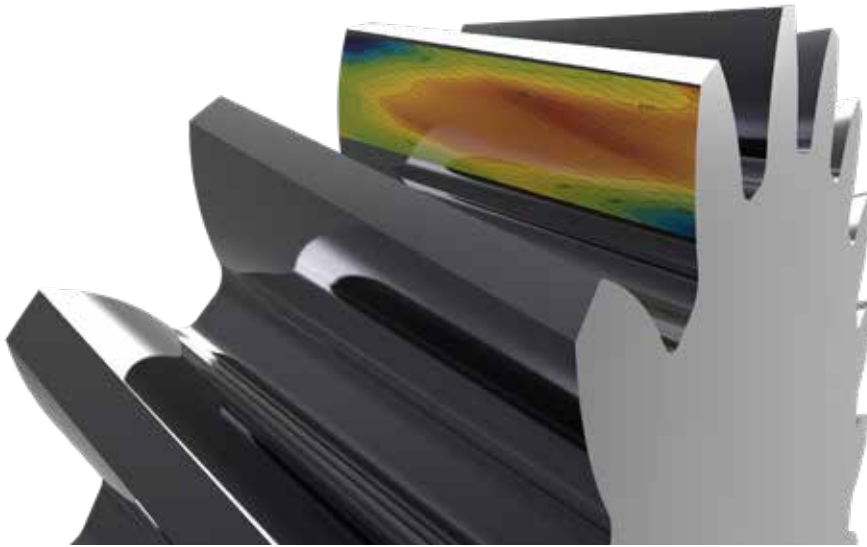
The FVA-Workbench 5.0 is a powerful tool that is indispensable for the development of gearboxes. Particularly impressive is the software's wide range of functions, which is based on decades of research and development in the field of drive technology.

”

Karl Hahn,

Owner, Hahn GearTec e.U.





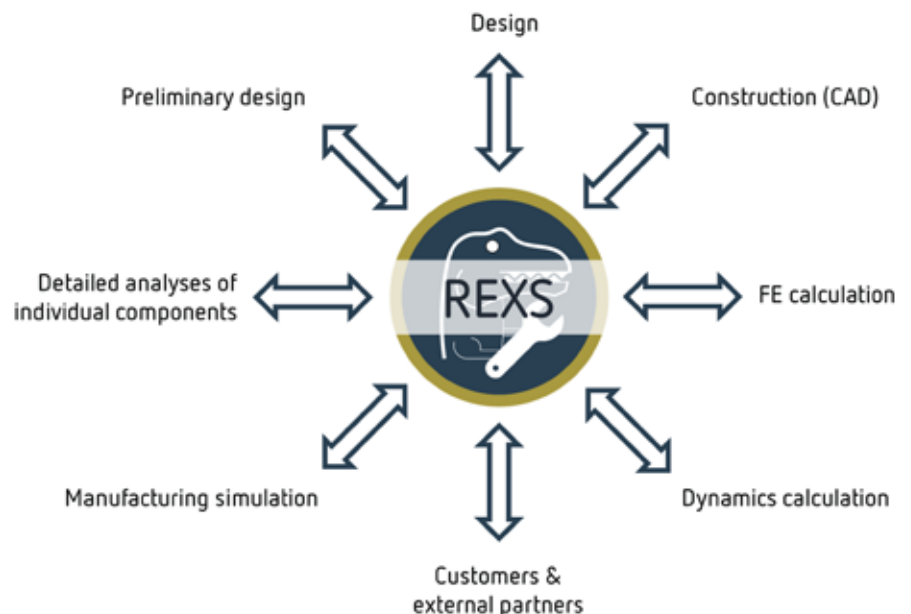
makes it easier for the user to simplify the component, enabling fast model preparation in which unnecessary details can be removed from the CAD model. In addition, the possibility of an internal parameterized geometry generation was created for the planet carrier. Geometry generated in this manner can be FEM-meshed and then used in place of an external geometry for the planet carrier. This allows a fast variation of the geometry parameters with direct feedback on the calculation results.

Interface for easy exchange of gearbox data: **REXS**

The standardized interface REXS (Reusable Engineering EXchange Standard) is integrated as of FVA-Workbench 5.0. Gearbox data from various programs can be easily exchanged using the interface. Thus, the REXS export and import of gearbox data acts a new feature. REXS is developed in cooperation with industry and research.

New version of the standardized REXS interface with increased usability and expanded scope

A large number of different software tools are used in gearbox development. Up to now, no standard has been established for exchanging gearbox data. FVA (Forschungsvereinigung Antriebstechnik e.V., the German Research Association for Drive Technology) is changing this with the development of the REXS interface, an industry-wide standard for exchanging gearbox data between



different CAE tools. The freely available standardized interface is being developed in close collaboration with industry and

research and is intended to minimize maintenance requirements and data errors when communicating and exchanging



data between different CAE tools. Version 1.1 of the interface was released on 26 October, 2018 and features greatly improved ease of use as well as an expanded specification scope. It also now offers users the ability to model planetary stages and FE assemblies as well as consideration of parameters from mechanical system calculations.

The specification now includes:

- Shafts
- planetary gears
- Cylindrical gears and gear stages
- Bevel gears and gear stages
- Rolling bearings
- FE assemblies
- External loads
- Shifting positions
- Load spectra

- Lubricants
- Materials
- Tools

In addition to the expanded contents, the new REXS database at www.rexs.info simplifies working with the specifications with many new features (navigation through different versions, validation, machine-readable export in .xml format, ChangeLog) as well as additional and more detailed attribute descriptions. The REXS interface has developed substantially in both content and usability since publication of the first version in November 2017.

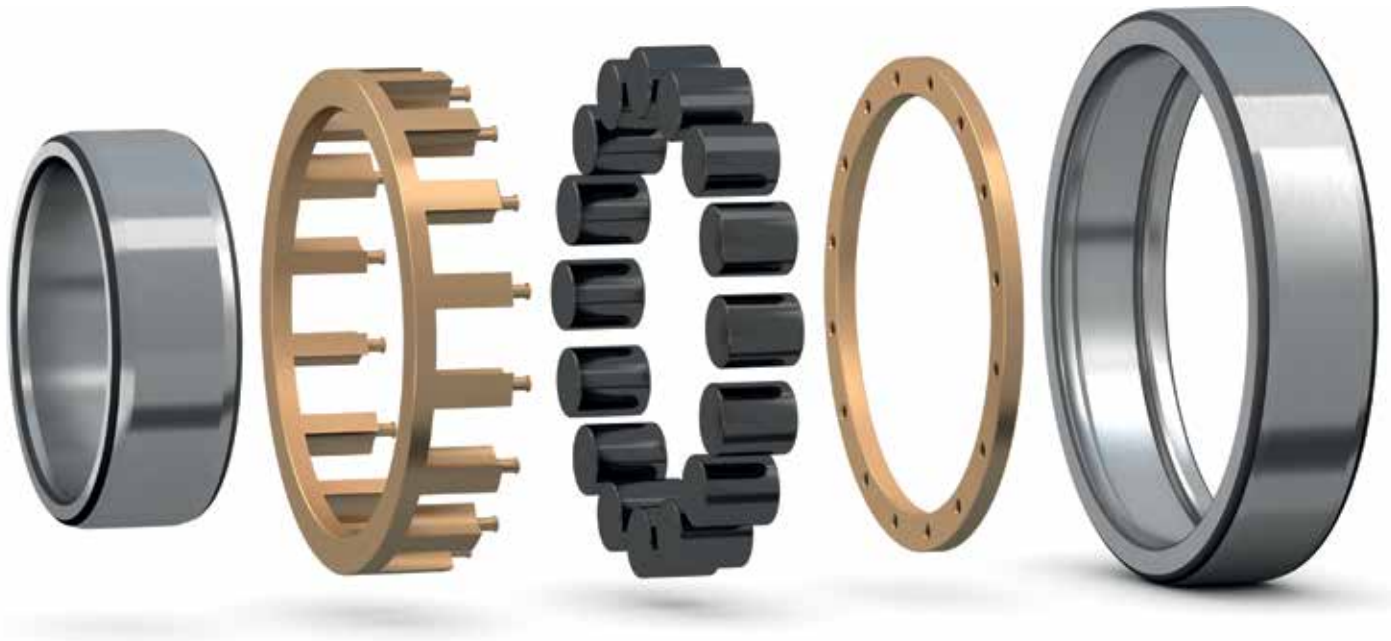
In 2019, the REXS specification will be further expanded to include modeling of flank modifications and notches as well as the parameters of various cylindrical and

bevel gear standards. Interested parties can contribute their suggestions at any time via the freely accessible REXS Ticket System and follow their implementation in the REXS development process. For more information visit www.rexs.info.

REXS in the FVA-Workbench 5.0

FVA-Workbench 5.0, the FVA's drive technology simulation platform, already supports the current version of the REXS interface, making a significant contribution to the efficient exchange of data. It also serves as a reference to users of how the interface can be implemented in a software package.

For more information visit www.fva-service.de



U n d e r s t a n d i n g **DAMAGE TOLERANCE IN HYBRID BEARINGS**

New research by SKF could make hybrid bearings more cost-effective and reliable, paving the way for their use in a wider range of applications.

Hybrid bearings, which combine hardened steel rings with rolling elements made of high-performance ceramic materials, are an increasingly popular option for demanding applications. Bearings of this type can outperform conventional designs where high speeds, high temperatures or poor lubrication conditions are experienced.

Those characteristics have led to their use in jet engines and other critical aerospace equipment. Hybrid bearings also provide high levels of electrical resistance, making them useful in applications, such as electric motors and generators, where stray currents can damage steel bearing surfaces.

Ceramic materials have many characteristics that make them ideal for bearing applications. Modern ceramics such as silicon nitride are hard, light and can be manufactured with an extremely smooth surface finish. Ceramic materials do have disadvantages, however. Despite continued efforts to improve their toughness, these materials can have issues with damage tolerance in the form of sensitivity to imperfections that may pre-exist in the material or on the surface, which will potentially endanger the integrity of the ceramic rolling elements used in hybrid bearings.

To reduce the occurrence of such

problems in service, ceramic bearing components are manufactured under extremely tight quality control, handled with great care during production and assembly operations, and inspected rigorously prior to release. That approach has created products that perform very well in service. But it also drives up cost, limiting the wider adoption of hybrid bearing technology.

One particular challenge for manufacturers is that they haven't historically had good models for the damage-tolerance of ceramic bearings. Some surface imperfections are so small that they have no effect on the performance or longevity of a bearing,

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“

In particular, our new model accounts for interactions between the bearing material and the lubricant. Lubricant that enters a crack or void in a bearing becomes pressurised by the bearing loads. That can impart a tensile stress which are generally considered undesirable for lowering the fatigue resistance of materials.

”



Junbiao Lai, Senior scientist at SKF

but without knowing exactly where the acceptable limits lie, manufacturers have had to take a conservative approach, rejecting components that might actually have performed perfectly in service.

Now a team from SKF's Research & Technology Department in the Netherlands is helping to take the guesswork out of ceramic product quality control. The group has developed a new predictive model of damage-tolerance for ceramic rolling elements used in hybrid bearings, allowing manufacturers to ascertain the precise threshold at which a microscopic imperfection should become a concern.

The team based its research on an extensive series of tests using hybrid bearings or components with imperfections artificially introduced into the surfaces of ceramic rolling elements. The project studied a range of common imperfections. They included contact marks, such as surface scratches that can be introduced during polishing operations, ring or C cracks, which occur if the component experiences an impact, and surface voids, which can be the result of imperfections in the ceramic materials. The artificial imperfections were created using various methods, including striking the ceramic ball surface in a controlled manner to create a crack, and laser machining to create a void of a precise size and shape.

These bearings or ceramic components were then tested on a rolling contact fatigue test rig under a wide range of loading and lubrication conditions until failure or suspension. The team repeated its experiments with different types and sizes of imperfection. Some bearings were run to failure, while others were removed from the rig before they failed and studied under the microscope so the team could see how cracks develop and propagate through the material.

The SKF team used its findings to build a new model based on fracture mechanics to predict the damage tolerance of ceramic rolling elements. “We based our work on fracture mechanics, but we added some significant extra





elements that account for the unique properties and failure mechanisms of ceramic materials under the relevant operation conditions of hybrid bearings in applications,” explains Junbiao Lai, a senior scientist at SKF .

“In particular, our new model accounts for interactions between the bearing material and the lubricant. Lubricant that enters a crack or void in a bearing becomes pressurised by the bearing loads. That can impart a tensile stress which are generally considered undesirable for lowering the fatigue resistance of materials.”

Junbiao Lai and his team are confident that their new model accurately reflects the behaviour of hybrid bearings in real operating conditions, and they are now working with SKF manufacturing engineers to apply their findings. “The model allows us to predict when a imperfection is stable, and when it is likely to cause cracks to develop and propagate.”

He explains, “That knowledge could help our manufacturing colleagues to optimise the tolerances they use in production, reducing unnecessary scrap, and it could also help them to refine their manufacturing, assembly



and handling procedures.” Ultimately, the work should make high performance hybrid bearings most cost-effective, allowing more applications to benefit from their unique and useful properties.

“

The model allows us to predict when a imperfection is stable, and when it is likely to cause cracks to develop and propagate.

”





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Precision bearings for precise diagnosis

Precision bearings from Rodriguez are used in many medical applications – for example in a high precision x-ray machine with C-arm that is used for diagnostics purposes in oncology. In this extremely sensitive field of application installed components must meet highest standards. For this reason, the Dutch medical device manufacturer VDL Konings has decided on turntable bearings from Rodriguez for the bearing of the massive swivel arm.

The Dutch company VDL Konings BV develops and produces medical devices, systems as well as modules which are used in radiology for diagnostic and therapeutic purposes. The C-arm is

specially designed for oncology – where the success of a treatment largely depends on the radiotherapeutic planning, the simulation and the treatment evaluation. The C-arm is exclusively used for

diagnostic purposes: In order to prepare and perform treatments accordingly, the location of the tumor, the position and dose of the radiation must be determined prior to the procedure. The appropriate





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accuracy is imperative to keep a procedure as small as possible in the final treatment of the patient. Another advantage of the C-arm x-ray machine is the fact that prior positions are automatically and precisely approached again.

High precision positioning – with turntable bearings

A number of factors have an influence on the accuracy in application. This also includes the mechanical components. The individual elements and assemblies form the base for meeting the high demands placed on the system: “The whole is only as good as the sum of its parts. For the high-precision positioning of the massive C-arm, the component for the bearing of this large system, is of great importance. VDL equips this rotation position with ball bearing slewing rings from Rodriguez.

The high-performance precision bearings are part of the Precision Bearings business unit of the power transmission and bearing specialist from Eschweiler. They are suitable for applications in which large tilting moments need to be supported or where large bearing diameters are required for design-related

purposes. Thanks to their constructional design, they safely absorb radial, axial and tilting moment loads with one bearing point. Therefore, bearings with radial and axial bearing combinations can often be realized with only one bearing point, and expenditure and costs for the design of the connection construction and the installation of the bearings can often be significantly reduced. Different sizes and versions – depending on the application requirements, without gear, with external or internal gear – are available as a standard in two types, with double-sided sealed raceway system.

An application-specific adapted solution

Narrower tolerances for axial and radial runout and the technical specifications provided by the customer required a customized design with a customized internal gear for this application. For cases like these, Rodriguez has set up an in-house production facility with high-performance machinery; here, individual solutions are implemented without ifs and buts. For the turntable bearing for VDL, the material is first tempered. This heat treatment

prevents the rings from warping in the subsequent processing; warping would result in functional inaccuracies both in diagnostics and radiotherapy. The outer ring was slightly modified in order to meet the installation specifications, and the grease nipple was counter sunk. This prevents anything from hooking to the arm in its rotary movement. To ensure the arm rotates in the same plane, has no range of motion and has a homogeneous rotation, the bearing is clearance-free and designed according to the specific rotation moment specifications. In addition, the shape and tolerances of the gear teeth were modified to ensure smooth running, reliable motion accuracy and less wear.

“The interplay of the technical components must be exactly coordinated,”





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says Sven Handels; the native Dutchman is Product Manager at Rodriguez and the sales executive for the customer VDL. The motor defines the drive pinion which in turn defines the requirements for the ball slewing connection. In accordance with the drive power, they are equipped with a gearing with head reduction and profile shift. This design allows for highest accuracy in the positioning and thus a corresponding repeatability.

Flexible response – thanks to in-house production

Specially modified turntable bearings are also required in other fields of applications, for example as a hot version, which can be used in a temperature range of up to 150 °C. For such high temperatures, the turntable bearing must be fitted with a special seal that has high thermal and chemical resistance. The guiding of the rolling elements is implemented in a steel cage, because – just as in conventional rubber materials for bearing seals – synthetic material would reach its limits under such operating conditions.

Here, the flexibility and know-how of

technical special solutions are particular strengths of Rodriguez, but also the possibilities offered thanks to the broad orientation of the machinery: In the area of precision bearings, for example, large diameter slewing bearings with outside diameters of up to 1,400 millimeters, or even the increasingly popular rotary units with smaller diameters starting at 15 millimeters, can be manufactured.

In linear technology, thanks to modern CNC machinery, it is possible to machine shafts and ball screw spindles with an outer diameter of up to 100 mm. Rodriguez always maintains its manufacturing facilities at the latest state of the art, with innovative equipment and advanced tools.

Author: Nicole Dahlen



New Features in Version 10/2018 of MESYS SHAFT AND BEARING CALCULATION SOFTWARE

A new version of the MESYS shaft and rolling bearing analysis software including new functionality is available. The bearing analysis software allows the calculation of the load distribution within the bearing and bearing life according ISO/TS 16281 and it is integrated in a shaft system calculation with additional possibilities like modal analysis, strength calculation for shafts and interfaces to gear calculations. Currently the software is used by customers in 25 countries on 4 continents.

Calculation of shaft stiffness for selected points

The software can now directly derive the stiffness of a shaft system for selected points. Therefore it is not necessary any more to run two calculations to derive a value for a system stiffness and the output of stiffness is available too in parameter variations. The stiffness is available for translations in the three directions of axis and for rotation around the three axes of the local coordinate system.

Bearing databases

The existing database with SKF catalog data was updated and a new database with catalog data from Schaeffler containing FAG and INA bearings was added.

REXS-format for data exchange

The REXS-format for data exchange with other calculation programs was added to the shaft system calculation. See www.rexs.info about information regarding the standard. Shaft systems including bearings and coupling by cylindrical and bevel gears can be exported or imported. Also load spectra are considered in the definition. This

standard format should allow data exchange with other CAE programs.

Extensions for FEA integration

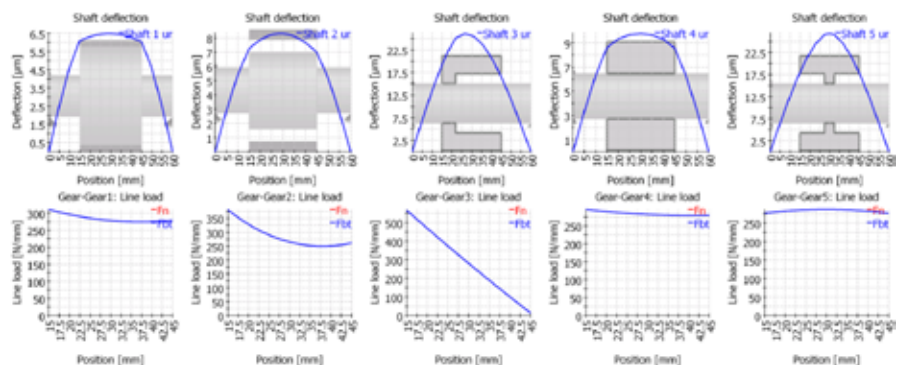
A large extent in version 10/2018

has the improved integration of FEA calculations into the software.

Now hexahedral and tetrahedral meshes can be generated using the integrated meshers. Second order elements should

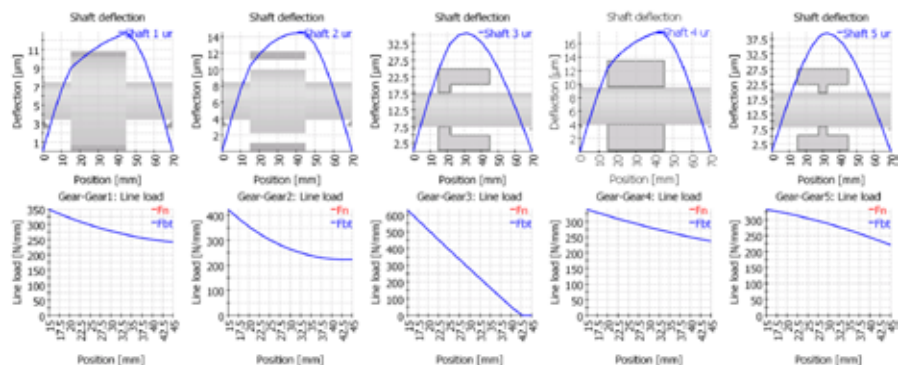
Load distribution for symmetric case

Central gear	1	2	3	4	5
Maximum shaft deflection [μm]	6.5	8.3	26.1	9.8	26.8
Line load wmax [N/mm]	311	382	566	296	288
Ratio wmax/wavg	1.10	1.34	2.00	1.04	1.01



Load distribution for eccentric gear

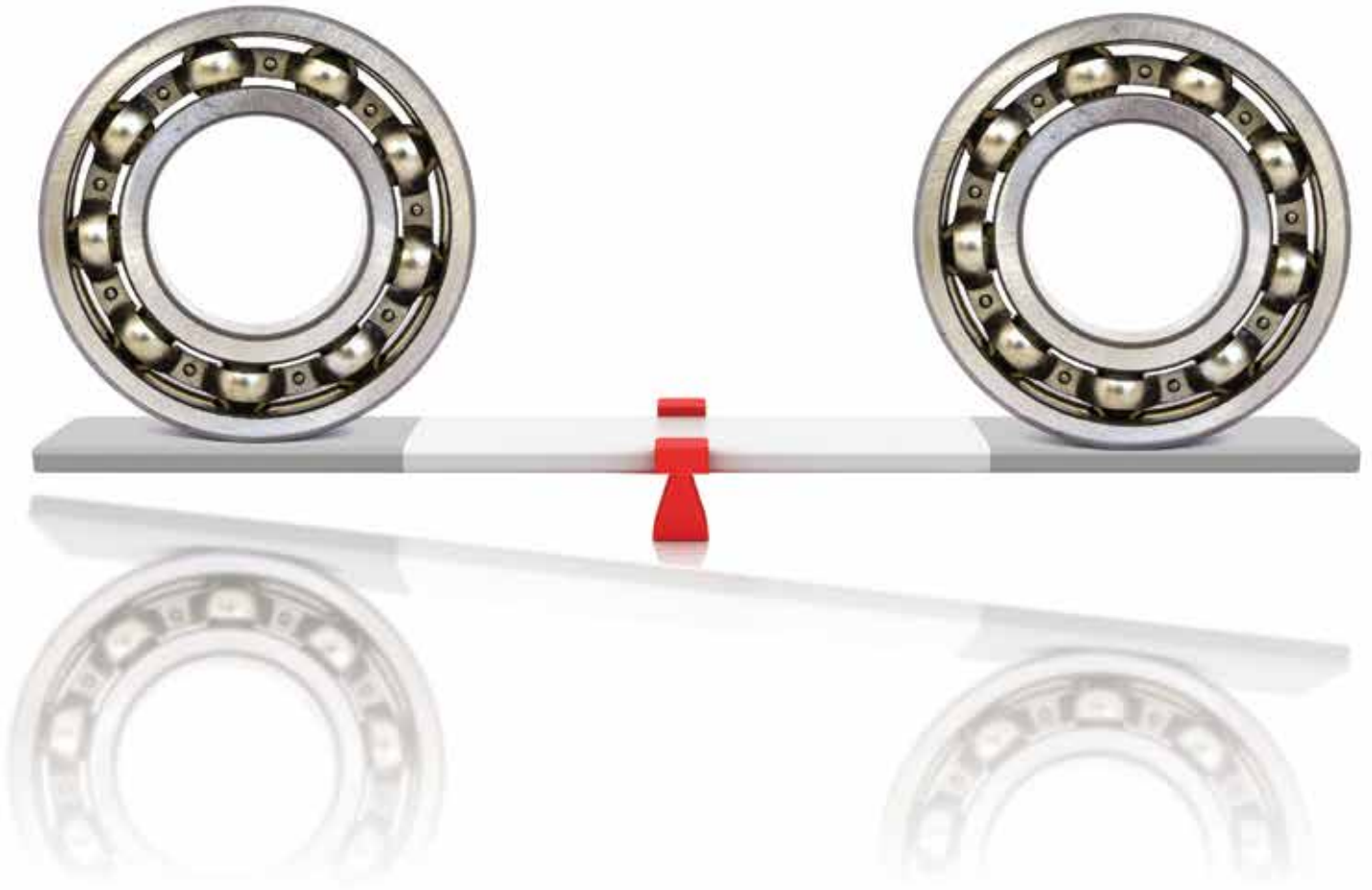
Eccentric gear	1	2	3	4	5
Maximum shaft deflection [μm]	12.8	14.4	35.6	17.6	39.4
Line load wmax [N/mm]	350	423	630	339	333
Ratio wmax/wavg	1.23	1.49	2.22	1.19	1.17



— Figure A

IS THERE REALLY A **DIFFERENCE?**

ARE YOU WILLING TO **RISK THE UNKNOWN?**



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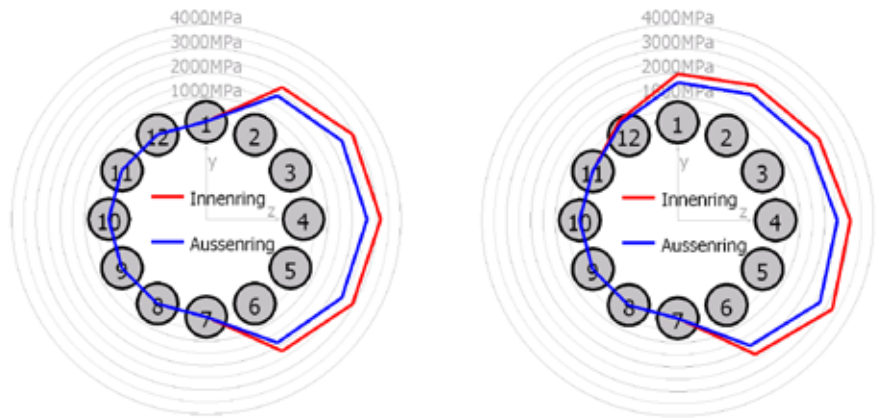
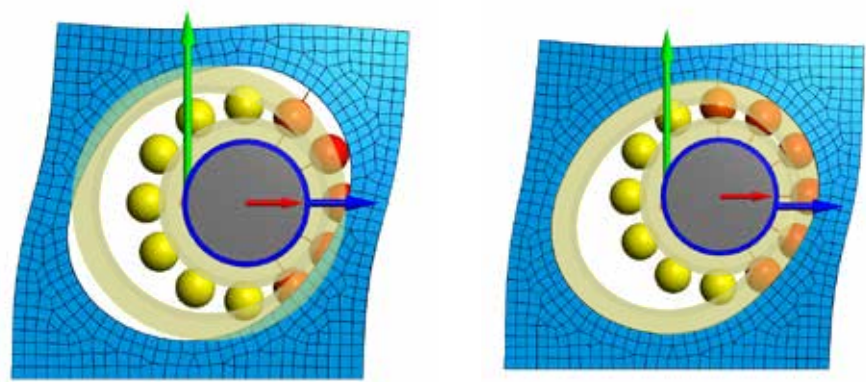
be used with tetrahedral elements.

Forces and supports can be defined directly on imported 3D-elastic parts. This allows to add forces on a housing or to define additional stiffness supporting a housing.

Version 10/2018 allows to consider elastic bearing rings and elastic gear bodies for cylindrical gears.

The following images (Figure A) show the shaft deflection and the line load for five different gear bodies. The first two cases use a beam model with a full or reduced diameter for the gear body. The following three cases use a FEA model for the gear stiffness. Using a beam model only, the diameter used for the gear body for a full cylindrical gear can be defined as the root diameter of the gears (plus some small amount for stiffness of the teeth, case 1) with leads to similar results for the flank line deformations like in case 4 with a full cylinder as FEA model. But it leads to smaller deflection of the shaft. Using a smaller diameter for the gear body in the beam model leads to larger shaft deflection, but it also leads to larger deflections of the flank line which is unwanted (Case 2). Using the FEA based gear body, both shaft deflection and flank line deformations can be considered more accurately.

The elastic deformations of bearing rings lead to differences in the load distribution within the bearings as can be seen in the following simple example (Figure B) with a horizontal load on the bearing. The left case does not consider deformations of the bearing and the



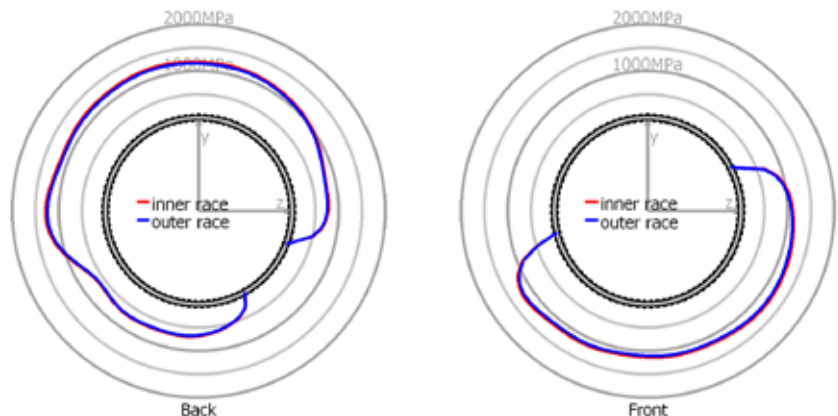
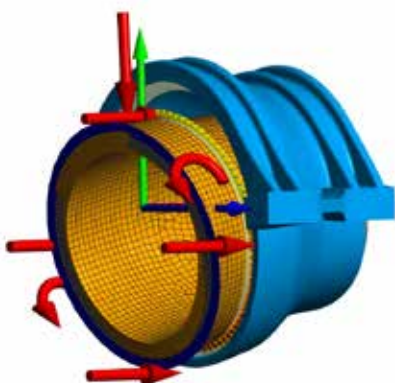
— Figure B

right image takes into account these deformations of the bearing rings. Either only the stiffness of the FEA parts is taken into account and its deformation is used for the deformation of the bearing ring or an additional stiffness of the bearing ring itself is considered.

Another example for the stress distribution in a large bearing with elastic rings is shown in following image (Figure C). The stiffening effect of the housing can be especially seen in the back bearing.

After a one-time condensation for 3D-elastic FEA based parts the calculation time is seconds as with the beam model. Therefore parameter variations of load spectra can be considered like for the beam models.

For further information please contact:
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— Figure C

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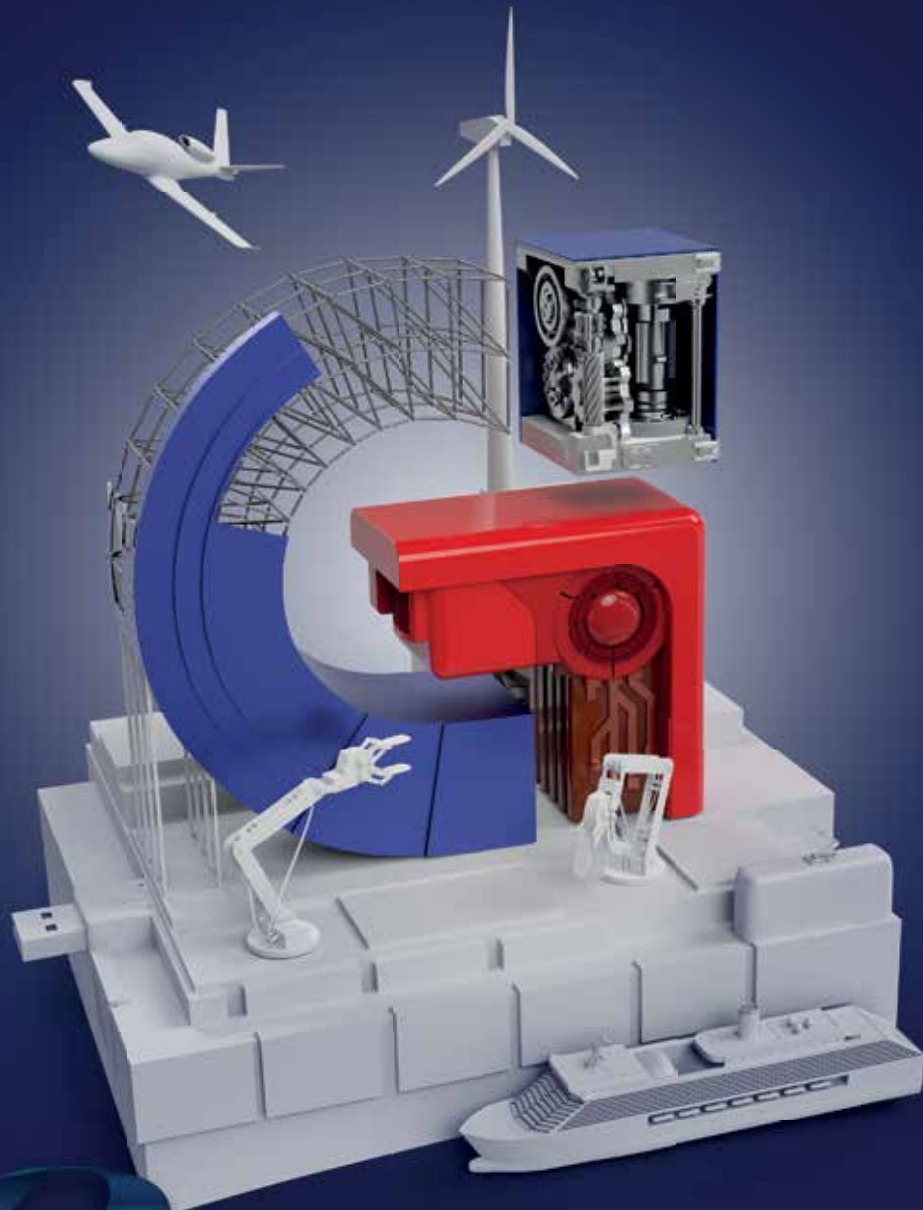


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www.easyfairs.com/index.php?id=106956

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Moscow / Russia

Exhibition for the packaging machinery

www.rosupack.com

INDUSTRY

MIDEST LYON

05 Mar - 08 Mar 2019

Lyon / France

Maintenance, subcontracting
and industrial equipmentwww.midest.com

MANUFACTURING

FUTURE FACTORY

11 Mar - 12 Mar 2019

Mumbai / India

The SMART manufacturing event of India

www.futurefactoryindia.com

INDUSTRY

MANUFACTURING EXPO

12 Mar - 14 Mar 2019

Lagos / Nigeria

Manufacturing and equipment expo

www.nigeriamanufacturingexpo.com

MINING

DRC MINING WEEK

19 Jun - 21 Jun 2019

Lubumashi / Congo

The largest mining and industrial
platform in the DRC.www.drcminingweek.com

FOOD & BEVERAGE

FISTAL TECNOLOGIA

25 Jun - 28 Jun 2019

Sao Paulo / Brazil

Food and beverage machinery
& processing eventwww.fispaltecnologia.com.br

MOTION ELECTRONICS

PCIM ASIA

26 Jun - 28 Jun 2019

Shanghai / China

Power Conversion, Intelligent Motion
event in China, for specialists
in power electronics and its
applications in drive technologieswww.pcimasia-expo.com.cn



www.thailandindustrialfair.com

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- INDUSTRIAL SUPPLIES
- MATERIAL HANDLING & LOGISTICS
- GARMENT & PRINTTECH
- GARAGE EQUIPMENT

**13-16
FEBRUARY
2019**



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& Mining Equipment Exhibition

18-20 September 2019
Almaty, Kazakhstan

www.miningworld.kz



2019 AGENDA

EVENTS, EXHIBITIONS & CONFERENCES

MOTION & DRIVE

IAMD SHENZHEN

26 Jun - 28 Jun 2019
Shenzhen / China

The largest and most influential motion
& driven show in South China

www.ia-shenzhen.com

MEDIA PARTNER
**Bearing
NEWS**

TEXTILE MACHINERY

GFT

03 Jul - 06 Jul 2019
Bangkok / Thailand

Textile machinery exhibition

www.gftexpo.com

FOOD & BEVERAGE

FOOMA

09 Jul - 12 Jul 2019
Tokyo / Japan

Food & beverage exhibition

www.foomajapan.jp

AUTOMOTIVE

DRITEV

10 Jul - 11 Jul 2019
Bonn / Germany

Drivetrain system for vehicles and
transmission developers conference

<https://bit.ly/2AuNRLH>

AUTOMOTIVE

AUTOMECHANIKA

10 Jul - 12 Jul 2019
Mexico City / Mexico

International automotive parts exhibition

www.paaceautomechanika.com

MACHINE TOOLS

DELHI MACHINE TOOL EXPO

08 Aug - 11 Aug 2019
New Delhi / India

The machine tool exhibition
for North India

www.mtx.co.in

TEXTILE MACHINERY

GARTEX INDIA

10 Aug - 12 Aug 2019
New Delhi / India

GARTEX- complete garment
manufacturing solutions show

www.gartexindia.com

MARINE

MARINTEC SOUTH AMERICA

13 Aug - 15 Aug 2019
Rio de Janeiro / Brazil

Maritime maintenance and shipbuilding

www.marintecsa.com.br

2019 AGENDA

EVENTS, EXHIBITIONS & CONFERENCES

AUTOMOTIVE

AUTOMECHANIKA MIMS MOSCOW

26 Aug - 29 Aug 2019
Moscow / Russia

23rd International Exhibition of
Automotive Parts, Components, Car
Maintenance Equipment and Products

www.mims.ru

MARINE

INAMARINE

28 Aug - 30 Aug 2019
Jakarta / Indonesia

Shipbuilding, offshore, marine
equipment and machinery expo

www.inamarine-exhibition.net

MEDIA PARTNER
**Bearing
NEWS**

OFFSHORE

OFFSHORE EUROPE

03 Sep - 06 Sep 2019
Stavanger / Norway

Biggest offshore event of Europe

www.offshore-europe.co.uk

FOOD & BEVERAGE

FOODWORLD ISTANBUL

04 Sep - 07 Sep 2019
Istanbul / Turkey

27th International Food Products &
Processing Technologies Exhibition

www.worldfood-istanbul.com

MEDIA PARTNER
**Bearing
NEWS**

MARINE

BALTEXPO

09 Sep - 11 Sep 2019
Gdansk / Poland

Technologies and solutions available
for the maritime industry.

www.baltexpo.ztw.pl

MACHINERY

TURBOMACHINERY & PUMP

10 Sep - 12 Sep 2019
Houston / USA

Turbomachinery & pump symponia

<https://tps.tamu.edu>

HUSUM WIND

HUSUM WIND

10 Sep - 13 Sep 2019
Husum / Germany

Wind industry exhibition

www.husumwind.com

INDUSTRY

MANUFACTURING EXPO

12 Mar - 14 Mar 2019
Lagos / Nigeria

Manufacturing and equipment expo

www.nigeriamanufacturingexpo.com

MINING

ELECTRA MINING BOTSWANA

10 Sep - 12 Sep 2019
Gaborone / Botswana

Mining, Industrial, Construction and
Electrical Engineering Exhibition

www.electramining.co.bw

MANUFACTURING

HYBRID / COMPOSITES EUROPE

10 Sep - 12 Sep 2019
Stuttgart / Germany

Production of hybrid components
and applications

www.hybrid-expo.com

AUTOMATION

ALL AUTOMATION

11 Sep - 12 Sep 2019
Leipzig / Germany

Regional automation show of Hamburg

www.automation-leipzig.com

Koyo

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www.koyo.eu << visit our website



JTEKT

Koyo

TOYODA

CASE STUDY

Single Row Sphericals

BMI engineering developed a series of bearings that are dimensionally interchangeable with conventional double row spherical rollers

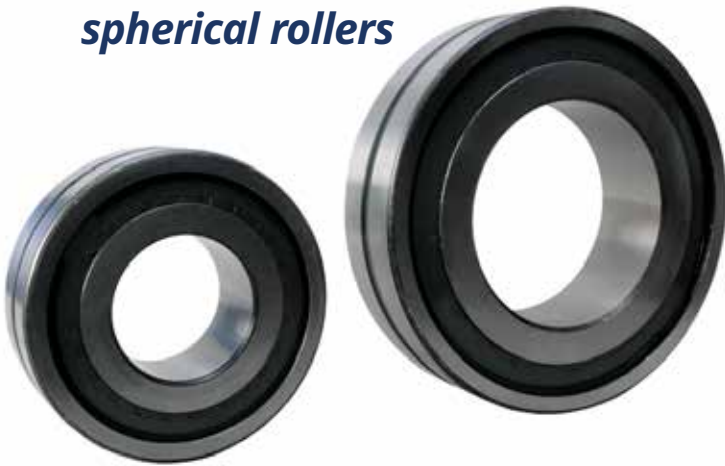
BMI has developed single row sphericals similar to McGill in 22200 series and 22300 series.

This series is **available with and without seals** but normally with seals is preferred to get maximum life.

Also a single row of large roller results in **increased dynamic load rating and greater mis-alignment** as well.



This series is exactly interchangeable with conventional double row spherical roller bearings dimensionally. Sealing ensures protection from contamination in severe environment for longer life.



For any non - standard developments feel free to reach out to BMI team on sales@bmibearings.com and we will be glad to assist you.



ENERGY

EPOCH 2019

16 Sep - 17 Sep 2019
Thessaloniki / Greece

Exploration and offshore
production congress hub

www.oilepoch.com

MACHINE TOOLS

EMO HANNOVER

16 Sep - 21 Sep 2019
Hannover / Germany

International trade fair for metalworking

www.emo-hannover.de

MEDIA PARTNER
**Bearing
NEWS**

MACHINE TOOLS

MWCS

17 Sep - 21 Sep 2019
Shanghai / China

Metalworking and CNC Machine Tool Show

www.metalworkingchina.com

CONSTRUCTION

KAZCOMAK

18 Sep - 20 Sep 2019
Almaty / Kazakhstan

Kazakhstan road and heavy
construction machinery exhibition

www.kazcomak.kz

MINING

MINING WORLD CENTRAL ASIA

18 Sep - 20 Sep 2019
Almaty / Kazakhstan

Central Asian mining exploration
& mining equipment exhibition

www.miningworld.kz

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**Bearing
NEWS**

AUTOMATION

IAS

17 Sep - 21 Sep 2019
Shanghai / China

Largest industrial automation
show of China

www.industrial-automation-show.com

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AUTOMOTIVE

AUTOMECHANIKA

18 Sep - 21 Sep 2019
Johannesburg / South Africa

The World's Leading Trade Fair for
the Automotive Service Industry

www.automechanikasa.co.za

MATERIALS HANDLING

CEMAT RUSSIA

24 Sep - 26 Sep 2019
Moscow / Russia

International Exhibition for
materials handling, warehousing
equipment and logistics

www.cemat-russia.ru

POWER TRANSMISSION

EPTDA CONVENTION

25 Sep - 27 Sep 2019
Tenerife / Spain

Annual event of the EMEA Power
Transmission Distributors Association

www.eptda.org

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NEWS**

AUTOMATION

AUTOMATION EXPO

25 Sep - 28 Sep 2019
Mumbai / India

India's leading automation and
instrumentation exhibition

www.automationindiaexpo.com

2019 AGENDA

EVENTS, EXHIBITIONS & CONFERENCES

PUMP & VALVES

PUMPS & VALVES

02 Oct - 03 Oct 2019
Rotterdam / Netherland

Pump and valves show of The Netherlands

www.easyfairs.com

AUTOMATION

MOTEK

07 Oct - 10 Oct 2019
Stuttgart / Germany

International trade fair for automation
in production and assembly

www.motek-messe.de

GENERAL INDUSTRY

MSV Brno

07 Oct - 11 Oct 2019
Brno / Czech Republic

International engineering fair

www.bvv.cz

FOOD & BEVERAGE

AGROPRODMASH

07 Oct - 11 Oct 2019
Moscow / Russia

Machine & equipment for food
and beverage industry

www.agroprodmas-expo.ru

MANUFACTURING

METALEX

10 Oct - 12 Oct 2019
Ho Chi Minh / Vietnam

Metalworking, components
and subcontracting.

www.metalexvietnam.com

BEARING & POWER TRANSMISSION

BEARING CONFERENCE

16 Oct - 18 Oct 2019
Mumbai / India

International bearing and
power transmission industry
exhibition and conference

www.bearing-expo.com



INDUSTRY

HANNOVER MESSE SINGAPORE

22 Oct - 24 Oct 2019
Singapore / Singapore

Industrial transformation show

www.industrial-transformation.com



POWER TRANSMISSION

PTC ASIA

23 Oct - 26 Oct 2019
Shanghai / China

Power transmission and
control exhibition

www.ptc-asia.com



BEARING & POWER TRANSMISSION

BEARING CONFERENCE

23 Oct - 26 Oct 2019
Shanghai / China

International bearing industry conference

www.bearing-expo.com



MATERIALS HANDLING

CEMAT ASIA

23 Oct - 26 Oct 2019
Shanghai / China

Material handling, automation,
transport/logistics fair

www.cemat-asia.com

PACKAGING

EURASIA PACKAGING

23 Oct - 26 Oct 2019
Istanbul / Turkey

International packaging machinery fair

www.packagingfair.com

METAL

ANKIROS

25 Oct - 27 Oct 2019
Istanbul / Turkey

International Iron-Steel, Foundry
and Non-Ferrous Metals Technology,
Machinery and Products Trade Fair

www.messe.de

2019 AGENDA

EVENTS, EXHIBITIONS & CONFERENCES

MARINE

EUROPORT

05 Nov - 08 Nov 2019
Rotterdam / Netherland

Event focuses on specialised
ships and the smart solutions

www.europort.nl

AGRICULTURE

AGRITECHNICA

10 Nov - 16 Nov 2019
Hannover / Germany

The leading agriculture machinery event

www.agritechnica.com

MEDIA PARTNER
**Bearing
NEWS**

ENERGY

POWER-GEN EUROPE

Paris / France
Shanghai / China

Power generation equipment,
environmental control
equipment and services

www.powergeneurope.com

COAL POWER PLANT

CICEME

21 Nov - 23 Nov 2019
Beijing / China

International Coal Equipment and
Mining Technology Exhibition

www.ciceme.com

WINDPOWER

WINDEUROPE OFFSHORE

26 Nov - 28 Nov 2019
Copenhagen / Denmark

Wind Energy Exhibition

www.windeurope.org

PAPER

PAPEREX SOUTH INDIA

03 Dec - 06 Dec 2019
New Delhi / India

Paper Industry Trade Fair

<http://india.paperex-expo.com/Home>

CONSTRUCTION

EXCON

10 Dec - 14 Dec 2019
Karnataka / India

Construction Equipment Exhibition

www.excon.in/aboutevent.php

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in **2019**
and
beyond!



Bearing EXPO & Conference

The Niche Event for Bearing & Rolling Equipment Components Industry

The International BearingEXPO & Conference is an unique event serving a wide scope of industrial professionals, distributors, original equipment manufacturers and reliability engineers. Each event is designed according to the demand and needs of the local players in the host countries.

The aim of BearingEXPO is to create synergy between the companies by providing the facilities for networking during the exhibitions and B2B meetings; sharing the latest available market knowledge, innovative products and services during the conferences; which are dedicated for the bearing, power transmission, motion & drive, lubrication and maintenance domains.

Agenda 2019



ISTANBUL 2019 (Conference)

during WIN EURASIA *show*
14 – 17 March 2019



HANNOVER 2019 (Conference)

during Hannover Messe *show*
01 – 05 April 2019



MUMBAI 2019 (Exhibition, Conference & B2B Meetings)

during BearingEXPO & Conference India *show*
16– 17 October 2019



SHANGHAI 2019 (BearingEXPO Pavilion, Conference & B2B Meeting)

during PTC ASIA *show*
23– 26 October 2019

CONTACT info@bearing-expo.com OR VISIT www.bearing-expo.com/events
FOR ALL VISITORS AND EXHIBITORS REGISTRATION DETAILS.

International BearingEXPO & Conference India 2019



The International BearingEXPO & Conference is an unique event for the bearing and rolling equipment components industries.

Exhibitors Profile : Bearing and PT/MC manufacturers, distributors, lubrication companies, maintenance professionals, equipment producers, industrial solution providers, engineering services and organizations

Visitors Profile : Manufacturers, distributors, reliability & maintenance engineers, machine producers, automotive-, steel-, cement-, mining-, energy-, food & beverage-, offhighway-, and marine industry professionals

Conference Topics : Commercial and technical seminars focusing on the current market situation; development of bearing suppliers and quality control processes; bearing root cause failure analysis for heavy applications; technical insights about Industrial IOT; precision engineering techniques and new technologies



EXHIBITORS
120+



VISITORS
2.000+



SIZE
2500+ m2



COUNTRIES
30+



SPEAKERS
15+



www.bearing-expo.com/events



A trade fair of superlatives

BAUMA 2019: MORE EXHIBITORS, MORE VISITORS, MORE OPPORTUNITIES

- A new record: More than 3,500 exhibitors from 55 countries
- New opportunities: Virtual reality and bauma PLUS
- Klaus Dittrich, head of the fair: "We continue to surpass ourselves – also digitally."

Six months before the start of the world's leading trade fair for construction machinery, bauma, on April 8, 2019, Messe München can already announce a new record number of exhibitors: More than 3,500 exhibitors from 55 countries will be there – almost 100 more than in 2016. bauma PLUS allows even more companies to present their products and services. Virtual reality will bring the construction site into the trade fair hall. What is more, the 600,000 visitor mark is ready to be passed.





“The industry is booming, which is also reflected in the growth of bauma. We’ve taken account of the rise in demand and expanded our site in eastern Munich to 614,000 square meters. Our aim is to offer a platform to as many exhibitors as possible. With bauma 2019, we continue to surpass ourselves – also digitally,” says Klaus Dittrich, Chairman and CEO of Messe München.

For the first time, visitors to Hall Bo will be able to experience the industry virtually – thanks to virtual and augmented reality. This is made possible through a combination of images, sound, or sensor

feedback, such as wind. “The booths have size limits, the digital areas is limitless. With new virtual offerings, we’re bringing the construction site into the trade fair and expanding our digital portfolio,” says project manager Mareile Kästner.

Participation concept for bauma PLUS

Another new feature are the bauma PLUS models that bring more exhibitors to the fair. With bauma PLUS ONSITE exhibitors can present their company on a compact area. bauma PLUS MOVE is a flexible co-working area where visitors

can meet exhibitors.

Press Release | October 23, 2018 | 2/2

Not only an opportunity for companies: “This allows visitors to get a more comprehensive picture of the providers in the industry. With the help of our new products, we also want to pass the 600,000 visitor mark and extend our status as the world’s biggest trade fair,” explains Klaus Dittrich.

Visitors can find the latest list of exhibitors online in the bauma exhibitor database. More information about the trade fair is available at www.bauma.de





BEARING & GEARBOX SEMINARS

AACHEN (GERMANY) FEBRUARY 2019

SEMINAR PROGRAM

BEARINGS

18th of February 2018

Development of bearing suppliers and quality control during purchasing

19th of February 2018

Basics of bearing technology

20th of February 2018

Bearing failures: Investigation and analysis of practical examples

GEARBOXES

20th of February 2018

Bearing failures: Investigation and analysis of practical examples

21th of February 2018

Preventive maintenance and condition monitoring of industrial gearboxes

22th of February 2018

Supplier development for large industrial gearboxes and quality control

BEARING SEMINARS

Development of bearing suppliers and quality control during purchasing

18th of February 2018, 10:00 a.m. – 05:00 p.m.

Global sourcing of bearings opens plenty of opportunities for optimization of supply chains. However, any new supplier approval goes along with a certain quality risk. Therefore, this seminar is focused on the following subjects:

1. Definition of quality requirements, technical specifications
2. Approach during supplier visits and audits
3. Requirements related to documentation of production
4. Methods for incoming inspection
5. Concepts for quality control

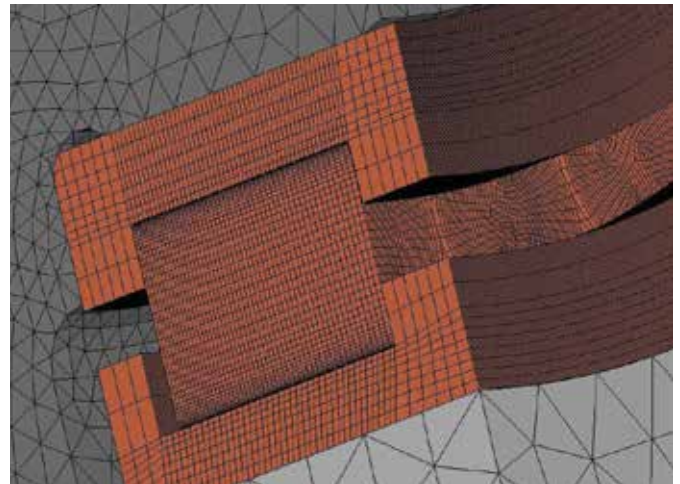


Basics of bearing technology

19th of February 2018, 10:00 a.m. – 05:00 p.m.

This one day seminar provides basic knowledge especially for design of bearing arrangements and for quality assurance during purchasing. Lectures shall focus especially on:

1. Types, Properties, Concepts
2. Basics of Tribology
3. Raceway crowning
4. Material properties
5. Sample assesment



Bearing Failures: Investigation and analysis of practical examples

20th of February 2018, 10:00 a.m. – 05:00 p.m.

Identification and understanding of failure root causes is necessary in order to initiate the required counter measures. Therefore, this seminar shall show based on practical examples how damage characteristics can be identified and to which conclusion they lead. Main topics are especially:

1. Methods for damage investigation
2. Damage mechanisms
3. Quality characteristics of bearings
4. Examples from numerous applications



GEARBOX SEMINARS

Preventive maintenance and condition monitoring of industrial gearboxes

21th of February 2018, 10:00 a.m. – 05:00 p.m.

In many technical systems, breakdowns of particular components lead to enormous subsequent costs as production will be affected significantly. Detection of damages at early stages can lead to minimization of downtime and helps to avoid secondary damages by which overall breakdown costs can be highly reduced. Therefore, this seminar refers to the following topics:

1. Investigation of lubricants
2. Regular inspection and endoscopy
3. Vibration measurement and analysis of obtained results
4. Automation of shutdown in case of detected defect



Supplier development for large industrial gearboxes and quality control during purchasing

22th of February 2018, 10:00 a.m. – 05:00 p.m.

Large industrial gearboxes are typically produced in small series while frequently, individual solutions are requested which require close collaboration between supplier and customer. Here, especially clear communication of requirements, verification of technical concepts and of course the general assessment of production processes are essential. Accordingly, the topics of this seminar are:

1. Structure and content of technical specifications
2. Verification of technical documents such as drawings, stress and lifetime calculations of shafts, gearings, bearings and housings
3. Approach during supplier visits and audits
4. Requirements related to documentation of production
5. Methods for incoming and production related inspection



"Special Deals"

BEARING PACKAGE

- ✓ Development of bearing suppliers and quality control during purchasing
- ✓ Basics of bearing technology
- ✓ Bearing failures: Investigation and analysis of practical examples

GEARBOX PACKAGE

- ✓ Bearing failures: Investigation and analysis of practical examples
- ✓ Preventive maintenance and condition monitoring of industrial gearboxes
- ✓ Supplier development for large industrial gearboxes and quality control



You can download the registration form and all the seminar details on the Elgeti Engineering website at www.elgeti-engineering.de in order to subscribe for one or more of the training seminars or contact Ms. Alexandra Becker on ab@elgeti-engineering.de or call +49 (0) 241 16 91 93 20

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Fax: +49 (0) 241 16 91 93 10



GETPRO

7th Conference on **GEAR AND DRIVETRAIN PRODUCTION**

March 19-20, 2019 in Würzburg

The successful GETPRO Gear and Drivetrain Production Conference has been held every two years since 2007. More than 300 leading experts and 35 exhibitors from industry and research come together at this event to exchange knowledge and experience. Since its foundation, GETPRO has developed into one of the most important trade meetings for the production of gears and drivetrains worldwide. In 2019, the GETPRO Conference is expanding to an international audience.

A platform for dialogue and knowledge sharing

The goal of the GETPRO conference is to promote the exchange of knowledge and experience between science and industry, engineers and technicians who are involved in or responsible for the design, development, production, assembly, logistics, and operation of gear drives.

The individual technical presentations offer researchers, manufacturers of machines and components as well as users with practical experience the opportunity to share their knowledge.

Be part of the community and share your expertise

Become part of the community and help shape the program with your presentation. Feel free to submit a short version of your article at www.getpro.de/en/.

2019 Topics

- Materials for transmission components and tools
- Shaping and soft machining of transmission components
- Heat treatment
- Hard-fine machining
- Tools and clamping devices for soft and hard machining

- Bearings, shafts, and casings
- Lubricants for metalworking, assembly, and corrosion protection
- Coatings
- Measurement technology
- Assembly, handling, and quality management
- Production of electric machines, with a focus on transmissions/drivetrains

GETPRO goes international!

In 2019, the congress on Gear and Drivetrain Production will open up to an international audience and invite experts from all over the world to engage in dialogue, exchange of knowledge, and networking.

More information can be read at www.getpro.de/en

What If... YOU COULD IMPROVE LOCK RELIABILITY?

Sealmaster® Next Generation Skwezloc® Concentric Lock Design



Originally designed and patented in 1966, Sealmaster® SKWEZLOC® concentric lock has become synonymous with concentric locking. Through extensive research, it has been found that an overwhelming majority of Sealmaster customers prefer concentric locking for ease of installation but were seeking a design that met their shaft tolerances, ultimately leading to the Next Generation Skwezloc design. The Skwezloc concentric locking collar has been redesigned to provide improved lock reliability on turned, ground and polished (TG&P) shaft tolerances and now accommodates commercial turned and polished (T&P) shafting.

Due to the innovative circumferential groove on the inner ring bore that improves shaft grip, this locking collar clamp results in near perfect concentricity of the shaft to bearing bore and maintains near perfect ball path roundness. A larger cap screw and collar also improves the clamping force and holding power to the shaft. By reducing stress on the inner ring and adding a groove the decouples from the inner ring to improve elasticity, the next generation Skwezloc locking collar has a design that meets the customer shaft tolerance need.



SEALMASTER

Next Generation Skwezloc®
Concentric Lock Design for
Improved Lock Reliability

REGAL



Improved Lock Reliability

② INCREASED SCREW SIZE & LARGER COLLAR

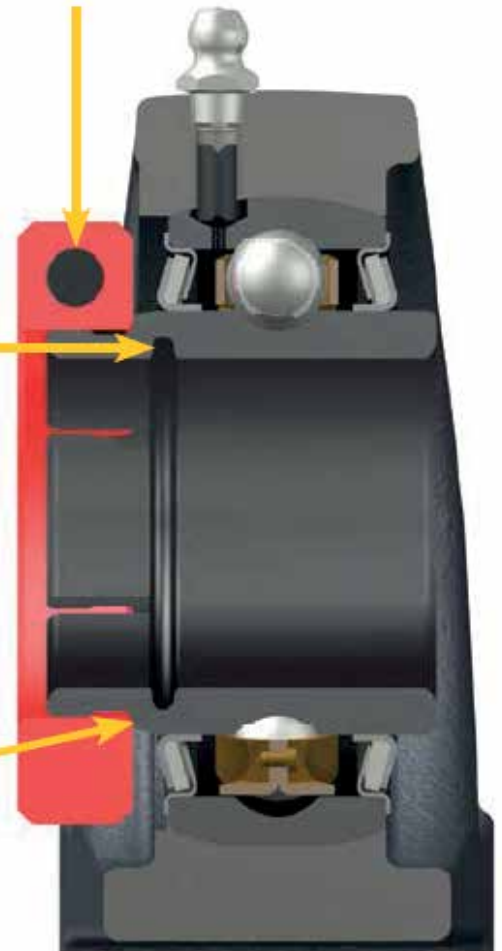
This design utilizes the same simple single screw installation of preceding models that prevents axial movement while also eliminating the risk of preloading the bearing, which are concerns when using an adapter lock design. The collar has a TORX® Plus head cup screw that outlasts stripping 12 times longer than hex head cap screws.

In laboratory push off testing, the Next Generation design resulted in a 113% holding force improvement on commercial grade Turned and Polished shafting versus the leading competitor. For original equipment manufacturers and end users that are currently using TG&P shafts, a 25% to 35% cost savings on shafting might be possible if the shafting specification is changed to commercial T&P!

The Sealmaster next generation Skwezloc concentric lock design is one of the newest innovations from Regal that puts our customers one step closer to creating a better tomorrow.

① CIRCUMFERENTIAL GROOVE

③ OPTIMIZED CHAMFER PROFILE



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BELTS



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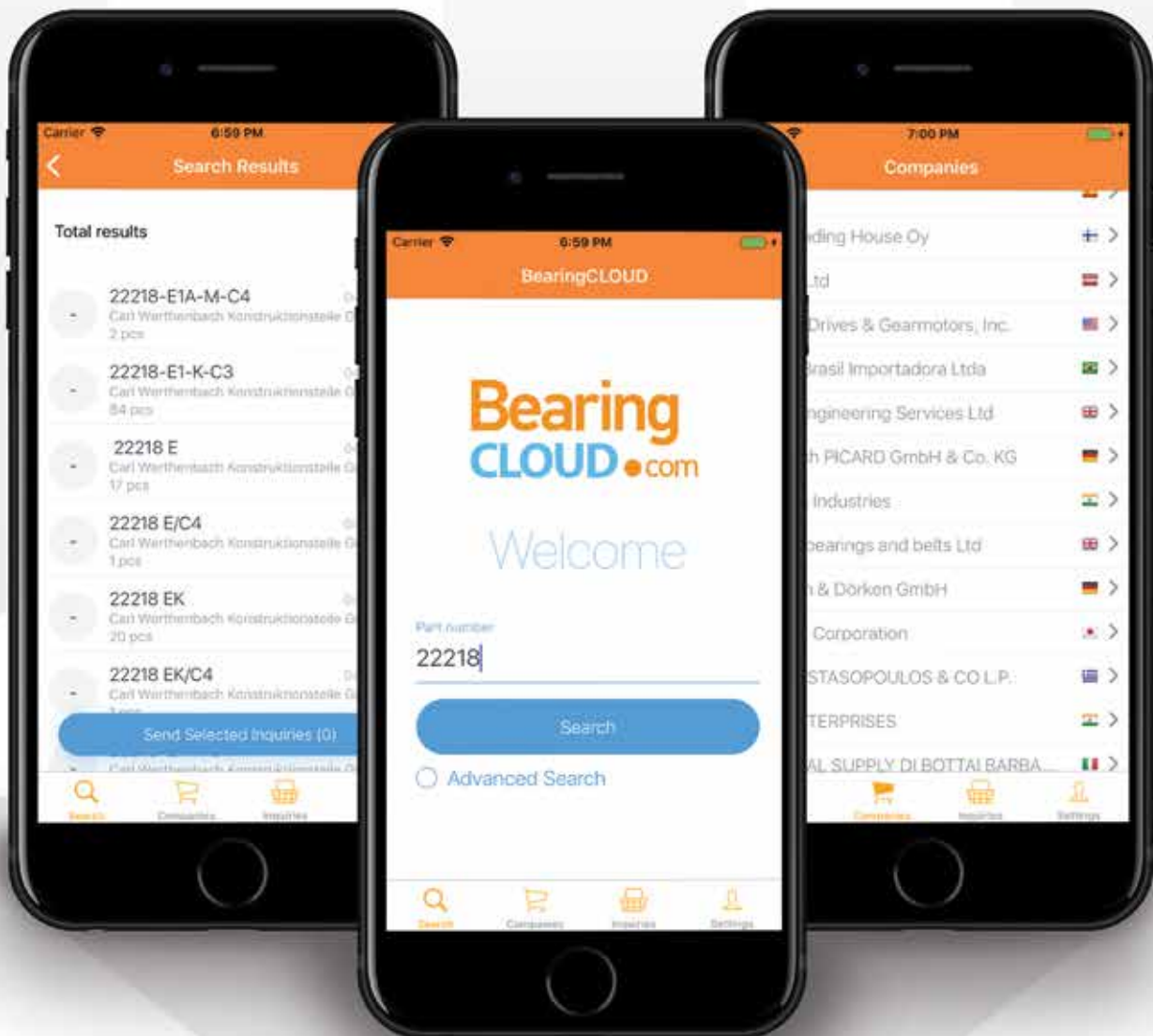
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- ✓ Chat Function



for details www.bearingcloud.com



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www.bearingcloud.com/apps

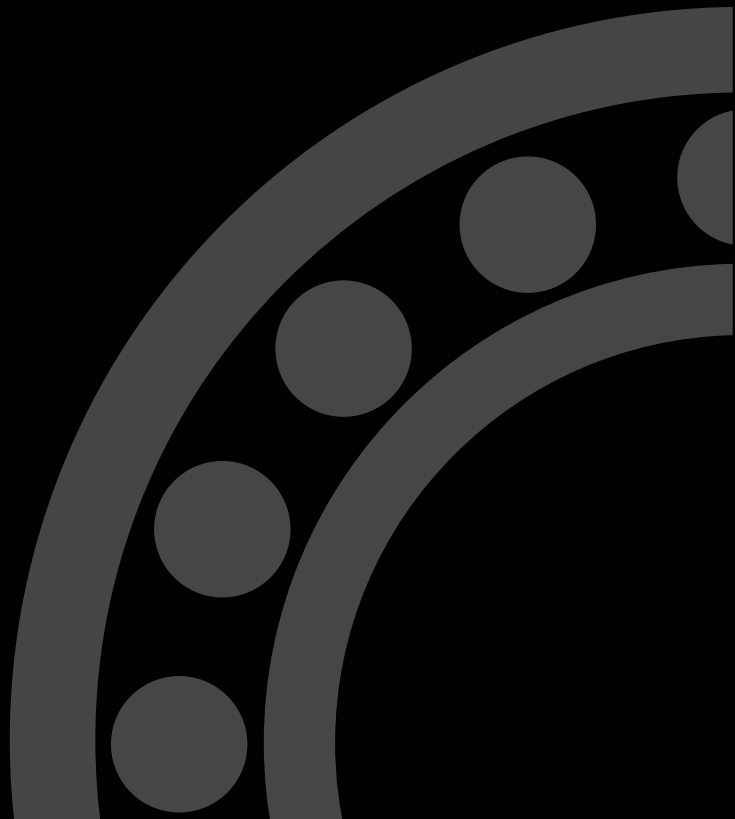




World's biggest Industrial Bearings Interchange System

Over 3 million bearing designations available in our database, with a complete and detailed explanation of bearing prefixes and suffixes. Roughly 100 bearing manufacturers and more than 600 bearing types listed. Purchase your license and gain instant access to Bearing Data's Interchange System.

www.bearingdata.com



1 Industry
3 Continents
4 Events
20 Speakers
100 Ideas & Innovations

Bearing EXPO & Conference



Agenda 2019



ISTANBUL 2019 (Conference)

during WIN EURASIA show

14 – 17 March 2019



HANNOVER 2019 (Conference)

during Hannover Messe show

01 – 05 April 2019



MUMBAI 2019 (Exhibition, Conference & B2B Meetings)

during BearingEXPO & Conference India show

16– 17 October 2019



SHANGHAI 2019 (BearingEXPO Pavilion, Conference & B2B Meeting)

during PTC ASIA show

23– 26 October 2019